# 8. Attachment H – Offset Potential within the buffer area of the proposed Garfield Quarry, Sanders Road, Garfield North

Colin Hines
Project Development Manager
Hanson Construction Materials Pty Ltd
Ground Floor,
601 Doncaster Road
Doncaster, VIC 3108

Date: 28 November 2014

Our reference: 6427

Dear Colin,

**Re: Offset Potential within the buffer area of the proposed Garfield Quarry, Sanders Road, Garfield North**

## 1. Introduction

Ecology and Heritage Partners Pty Ltd was commissioned by Hanson Construction Materials Pty Ltd (Hanson) to provide advice pertaining to the native vegetation credits which can be generated through the protection and enhanced management of remnant vegetation within the 100 metre landscape buffer area surrounding the proposed Garfield Quarry on Sanders Road, Garfield North (the study area)(Figure 1).

As part of the legislative requirements under the *Mineral Resources (Sustainable Development) Act 1990* (MRSD Act), a licensee must not do work within 100 metres of a home without the owner's consent. Therefore, a 100 metre landscape buffer is proposed to be established around the perimeter of the proposed quarry. It is understood that Hanson own this property, and are investigating the feasibility of protecting and managing the existing remnant vegetation within the buffer area to assist with meeting the offset obligations generated by the vegetation removal associated with the proposed adjacent Garfield Quarry development. Offset obligations generated by the proposed Garfield Quarry development are summarised in Table 1.

The purpose of this report is to provide advice relating to potential offset credits that can be generated through the management and permanent protection of remnant vegetation within the study, and the viability of establishing an offset site within the study area.

## 2. Study Area

The study area is located at 310 Sanders Road, Garfield North, approximately 80 kilometres south-east of Melbourne's CBD (Figure 1). The study area is owned by Hanson and it is adjacent to the proposed site for the future Garfield Quarry. The buffer area contains several discrete patches of moderate quality remnant vegetation and scattered trees through-out the property (Figure 1).

According to the Department of Environment and Primary Industries (DEPI) Biodiversity Interactive Map (DEPI 2014a), the study area occurs within the Highlands – Southern Fall bioregion. It is located within the

jurisdiction of the Port Phillip and Westernport Catchment Management Authority (CMA) and the Cardinia Shire municipality.

The study area is predominantly zoned Green Wedge Zone – Schedule 1 (GWZ1), and is covered by an Environmental Significance Overlay – Schedule 1 (ESO1) (DTPLI 2014).

## 3. Methods

### Desktop Assessment

Relevant literature, online-resources and numerous databases were reviewed to provide an assessment of flora and fauna values associated with the study area. The following information sources were reviewed:

- The DEPI Biodiversity Interactive Map (DEPI 2014a) for:
    - modelled data for location risk, remnant vegetation patches, scattered trees and habitat for rare or threatened species; and
    - the extent of historic and current EVCs.
- DEPI's Native Vegetation Information Tool (NVIM) (DEPI 2014b) for the modelled Strategic Biodiversity Score (SBS) of the study area;
- The Victorian Department of Transport, Planning and Linear Infrastructure's (DTPLI) Planning Maps Online to ascertain current zoning and environmental overlays (DTPLI 2014); and,
- Aerial photography of the study area.

### Site Inspection

A site inspection of the study area was undertaken by a qualified and DEPI accredited ecologist on 3 November 2014. The study area was assessed, with all observed flora species recorded, any significant records mapped and the overall condition and extent of vegetation noted (via the habitat hectare methodology). Remnant vegetation in the local area was also investigated to assist in determining the pre-European vegetation within the study area. EVCs were determined with reference to DEPI pre-1750 and extant EVC mapping and their published descriptions (DEPI 2014c).

Based upon an ecological investigation of the proposed Garfield Quarry development (Ecology and Heritage Partners 2014c), offsets for vegetation removal are required including **0.009 general BEUs, 37.347 BEUs for Green Scentbark, 33.712 BEUs for Spotted Gum,** and **37.491 BEUs for Cobra Greenhood** (Table 1).

**Table 1.** Offset requirements for the proposed Garfield Quarry development.

| | | |
|---|---|---|
| **Offset requirements** | General Offsets Required (BEU) | **0.009** |
| | Specific Offsets Required (BEU) | **33.712** specific units of habitat for Spotted Gum<br>**37.491** specific units of habitat for Cobra Greenhood<br>**37.347** specific units of habitat for Green Scentbark |
| | Vicinity (catchment / LGA) | Port Phillip and Westernport CMA / Cardinia Shire Council (For General BEUs)<br>No Restrictions (for Specific BEUs) |
| | Minimum Strategic Biodiversity Score* | 0.125 |

**Note: BEU = Biodiversity Equivalence Units; * Minimum strategic biodiversity score is 80% of the weighted average score across habitat zones where a general offset is required.**

## 4. Results

The assessment recorded 19.687 hectares of remnant vegetation comprising three remnant EVCs within the study area: Lowland Forest (EVC 16), Riparian Scrub (EVC 191) and Herb-rich Foothills Forest (EVC 23), broken up into 14 different quality zones (Appendix 1). This assessment is consistent with DEPIs extant (2005) mapping that shows the study area to be dominated by Lowland Forest, Swampy Woodland/Swampy Riparian Woodland Complex, Damp Heathy Woodland, and Clay Heathland/Wet Heathland/Riparian Scrub Mosaic (DEPI 2014a).

The vegetation within the study area is of varying quality with most patches showing some level of modification and disturbance.

Through the protection and management of 19.687 hectares of remnant vegetation, the native vegetation credits that can be generated, and their attributes are summarised in Table 2, and detailed in Appendix 2. It should be noted that scattered trees cannot be used for offset purposes under the current native vegetation policy (DEPI 2013). However, should an offset site be established, scattered trees may be able to be sold separately to the offsets detailed below (Table 2) to meet scattered tree and Large Old Tree (LOT) and Medium Old Tree (MOT) obligations generated under the previous native vegetation policy (DEPI 2014d). This is discussed in further detail below.

**Table 2 – Native vegetation credits generated within the buffer area**

| | | |
|---|---|---|
| **Native Vegetation Credits** | Offset Site type | Remnant Protection |
| | General BEUs* | **0.928 BEUs** |
| | Specific BEUs | **2.474 BEUs** for Green Scentbark *Eucalyptus fulgens*<br>**2.094 BEUs** for Spotted Gum *Corymbia maculata*<br>**1.842 BEUs** for Cobra Greenhood *Pterostylis chlorogramma* |
| | Vicinity (catchment / LGA) | Port Phillip and Westernport CMA / Shire of Cardinia |
| | Strategic Biodiversity Score (SBS) | 0.328 (average) |
| | Minimum SBS of a clearing site[#] | 0.410 |

**Notes: * BEUs = Biodiversity Equivalence Units; # Minimum strategic biodiversity score is 80% of the weighted average score across habitat zones where a general offset is required.**

A total of **0.928 general BEUs,** or **0.242 general BEUs** and **2.474 BEUs for Green Scentbark, 2.094 BEUs for Spotted Gum,** and **1.842 BEUs for Cobra Greenhood** can be gained through the protection and management of 19.687 hectares of vegetation over a period of 10 years[1] (Appendix 2).

**Native Vegetation Credits**

Minimum management commitments/arrangements to generate native vegetation credits at a site with existing remnant vegetation, or a site proposed for revegetation can be broken up into two main strategies; 1) maintenance and 2) improvement. Some of these techniques include:

**Maintenance**

- Retention of all remnant trees (both alive and dead specimens).
- Removal of woody and herbaceous weeds.
- Foregoing allowed uses such as grazing and slashing activities.

**Improvement**

- Control/eradication of environmental or noxious weeds including those that are a threat to existing remnant vegetation.
- Fencing to restrict public/grazing access into areas of ecological value.
- Control of introduced animals such as foxes, rabbits and feral cats.
- Revegetation and/or supplement planting of locally indigenous tree, shrub and understorey species in appropriate areas (need to consider ecological function).

*Enhanced management of on-site remnant vegetation*

Retained native vegetation within a site which is considered protected can be used to generate native vegetation credits. Gain scoring through management of existing remnant vegetation operates by allocating a certain score based on the vegetation management actions that maintain vegetation quality, or at a higher level, improve vegetation quality, and from increasing the security arrangement, and from recognition of past management. The guidelines and methodology for gain scoring are presented in DEPI (2013) and are used to determine the 'gain' from activities such as, vegetation protection, maintenance and improvement activities, and increased security. Any offset site also requires management skills and long-term resourcing (at least a 10-year period).

[1] Note that some biodiversity equivalence units may be alternates. The use of any biodiversity equivalence units of one type within a BCA will result in a proportional reduction in biodiversity equivalence units of other types within that BCA. See Appendix 1 for BEU breakdown details.

### Strategic Biodiversity Score

The SBS of the study area varies from low to high (between 0.2 and 0.7) and will meet the general offset requirements for those general offset obligations generated by the proposed Garfield Quarry development.

### Approximate costs to establish an offset credit site

A summary of approximate costs to establish an offset site with Bushbroker are summarised in the offset report for the Wallaby Court property (Ecology and Heritage Partners Pty Ltd 2014a)

## 5. Conclusion

As Hanson already own this site, it is considered prudent to utilize the available offsets towards meeting the general and specific offset target generated by the proposed Garfield Quarry.

Although scattered trees are not able to be used to generate native vegetation credits under the current native vegetation policy, DEPI have recently extended the transition period to allow holders of past planning approvals issued prior to 20 December 2013 to have their offset requirements secured under the Framework. As such, offset owners or potential offset owners are able secure new offset sites and trade the credits in both habitat hectares and trees, or Guideline metrics until the review of this approach is held in early 2016 (DEPI 2014d).

The buffer area contains approximately 11 scattered trees, many of which are likely to be worth between $1,000 and $3,000 each under this scheme.

It is also possible that the study area may provide habitat in parts for the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed Southern Brown Bandicoot *Isoodon obesulus obesulus*, and Growling Grass Frog *Litoria raniformis* and Dwarf Galaxias *Galaxiella pusilla*, and may therefore contribute towards potential offset prices for these species under the EPBC Act should they also be recorded.

### Summary of available offsets

The general offset requirement of 0.009 BEUs generated by the Garfield Quarry can be achieved using the available general offsets within either the Tonimbuk Road property (0.018 BEUs) (Ecology and Heritage Partners 2014b), or the buffer area (0.242 BEUs), with the remainder able to be sold to a 3rd party, or kept for future use.

A summary of the specific offset deficit, based on the interrogation of DEPI's specific offset database, and the credits available within the Tonimbuk Road and buffer areas is provided below in Table 3.

**Table 3. Specific Offset deficit**

| Specific Offset Required | Scientific Name | Units Required | Units Available on DEPI Register | Tonimbuk Road | Buffer Area | Surplus / Deficit |
|---|---|---|---|---|---|---|
| Spotted Gum | *Corymbia maculata* | 33.712 | 17.849 | 3.09 | 2.094 | **-10.679** |

| Specific Offset Required | Scientific Name | Units Required | Units Available on DEPI Register | Tonimbuk Road | Buffer Area | Surplus / Deficit |
|---|---|---|---|---|---|---|
| Green Scentbark | *Eucalyptus fulgens* | 37.347 | 17.685 | 3.337 | 2.474 | **-13.8514** |
| Cobra greenhood | *Pterostylis chlorogramma* | 37.491 | 0 | 1.783 | 1.842 | **-33.866** |

Based our experience, DEPI are unlikely to approve a development proposal where the offset obligations cannot be demonstrated that they can be met. The remaining specific units will need to be sourced through additional landowners who register native vegetation credits with Bushbroker, and/or through the acquisition of land by Hanson that contain these modelled values.

It should be noted that we believe the modelled suitable habitat and distribution, and generated offsets of Specific BEUs for Spotted Gum is incorrect, and DEPI should be consulted to have the offset obligation for this species reconsidered.

Please feel free to contact me if you would like to discuss the implications of this report in further detail.

Yours Sincerely

Shannon LeBel
Consultant Botanist - Ecology and Heritage Partners Pty Ltd

## References


DEPI 2013. Native vegetation gain scoring manual: Version 1. Published by the Victorian Government Department of Environment and Primary Industries, Melbourne, May 2013.

DEPI 2014a. Biodiversity Interactive Map [WWW Document]. URL http://mapshare2.dse.vic.gov.au/MapShare2EXT/imf.jsp?site=bim. Victorian Department of Environment and Primary Industries.

DEPI 2014b. Native Vegetation Information Management Tool [WWW Document] URL http://nvim.depi.vic.gov.au/ Victorian Department of Environment and Primary Industries.

DEPI 2014c. Ecological Vegetation Class (EVC) Benchmarks for each Bioregion [WWW Document]. URL http://www.dse.vic.gov.au/conservation-and-environment/native-vegetation-groups-for-victoria/ecological-vegetation-class-evc-benchmarks-by-bioregion. Victorian Department of Environment and Primary Industries.

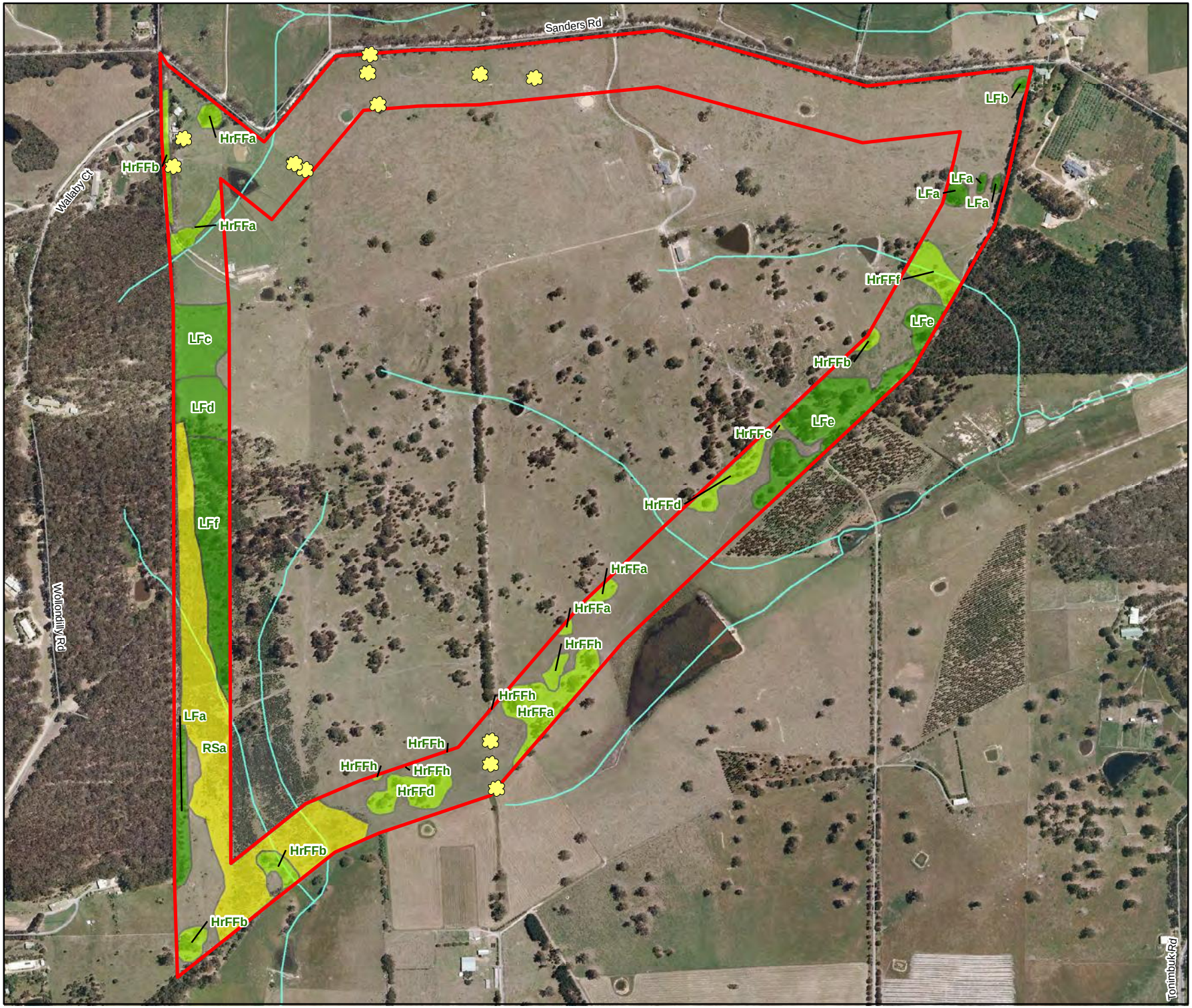
DEPI 2014d. DEPI Native vegetation regulations – Guidance statement. Native vegetation credit transition. Approved 10/11/2014. The State of Victoria Department of Environment and Primary Industries, Melbourne 2014.

DTPLI 2014. Planning Maps Online [www Document]. URL http://services.land.vic.gov.au/landchannel/jsp/map/PlanningMapsIntro.jsp.

Ecology and Heritage Partners Pty Ltd 2014a. Offset Potential at 55 Wallaby Court, Garfield North. Report prepared for Hanson Construction Materials Pty Ltd.

Ecology and Heritage Partners Pty Ltd 2014b. Offset Potential at 195 Tonimbuk Road, Garfield North. Report prepared for Hanson Construction Materials Pty Ltd.

Ecology and Heritage Partners Pty Ltd 2014c. Ecological Assessment for a Proposed Quarry on Sanders Road, Garfield, Victoria Report prepared for Hanson Construction Materials Pty Ltd. November 2014.




## Legend

- Offset site
- Scattered Trees (not included in offset calculations)

**Ecological Vegetation Classes**

- Herb-rich Foothill Forest
- Lowland Forest
- Riparian Scrub


# Figure 1

**Ecological features in the proposed offset site**

*Buffer around proposed quarry on Sanders Road, Garfield*

N

0 100 200

Metres

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## Appendix 1 – Habitat Hectare Results

**Table A1.** Habitat Hectares results for remnant vegetation recorded within the study area.

| Vegetation Zone | | A | B | C | D | E | F | G | H | F | A | B | C | D | E | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bioregion | | HSF | HSF | HSF | HSF | HSF | HSF | HSF | HSF | HSF | HSF | HSF | HSF | HSF | HSF | HSF |
| EVC / Tree | | HrFF | HrFF | HrFF | HrFF | HrFF | HrFF | HrFF | HrFF | LF | LF | LF | LF | LF | LF | RS |
| EVC Number | | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 16 | 16 | 16 | 16 | 16 | 16 | 191 |
| EVC Conservation Status | | LC | LC | LC | LC | LC | LC | LC | LC | LC | LC | LC | LC | LC | LC | Vu |
| Patch Condition | Large Old Trees /10 | 10 | 6 | 0 | 9 | 10 | 7 | 9 | 0 | 9 | 10 | 0 | 0 | 0 | 9 | 0 |
| | Canopy Cover /5 | 4 | 4 | 0 | 5 | 5 | 4 | 5 | 0 | 5 | 4 | 5 | 2 | 0 | 4 | 5 |
| | Under storey /25 | 5 | 10 | 10 | 10 | 15 | 20 | 15 | 5 | 15 | 5 | 5 | 15 | 15 | 5 | 20 |
| | Lack of Weeds /15 | 2 | 7 | 11 | 6 | 9 | 13 | 9 | 7 | 13 | 6 | 6 | 9 | 9 | 6 | 9 |
| | Recruitment /10 | 0 | 3 | 3 | 3 | 3 | 10 | 10 | 3 | 10 | 1 | 1 | 6 | 1 | 1 | 10 |
| | Organic Matter /5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 3 |
| | Logs /5 | 0 | 4 | 0 | 4 | 4 | 4 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Treeless EVC Multiplier | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1.25 |
| | Subtotal = | 25 | 39 | 29 | 42 | 51 | 63 | 57 | 20 | 61 | 30 | 21 | 37 | 30 | 30 | 58.75 |
| Landscape Value /25 | | 4 | 4 | 4 | 6 | 4 | 8 | 6 | 4 | 12 | 4 | 1 | 12 | 12 | 12 | 4 |
| Habitat Points /100 | | 29 | 43 | 33 | 48 | 55 | 71 | 63 | 24 | 73 | 34 | 22 | 49 | 42 | 42 | 62.75 |
| Habitat Score | | 0.29 | 0.43 | 0.33 | 0.48 | 0.55 | 0.71 | 0.63 | 0.24 | 0.73 | 0.34 | 0.22 | 0.49 | 0.42 | 0.42 | 0.63 |
| Total Area (ha) | | 2.00 | 0.95 | 0.02 | 1.32 | 0.00 | 0.59 | 0.00 | 0.18 | 2.28 | 0.95 | 0.07 | 1.20 | 0.99 | 2.80 | 6.30 |

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# Appendix 2 – Offset Report – Garfield Quarry Buffer Area

ADELAIDE 8 Greenhill Road, Wayville, SA 5034 P (08) 8372 7829
BRISBANE Level 22, 127 Creek Street, Brisbane, Qld 4000 P (07) 3221 3352
GEELONG PO BOX 8048 Newtown, Vic 3220 P (03) 5221 8122
MELBOURNE 292 Mt Alexander Rd, Ascot Vale, Vic 3032 P (03) 9377 0100 F (03) 9377 0199
www.ehpartners.com.au
ABN : 65 685 233 760

# Offset site report

This report provides information about native vegetation offset sites in accordance with the *Permitted clearing of native vegetation – Biodiversity assessment guidelines.* The information in this report is based on spatial information and site gain in habitat hectares, provided by the offset provider (or their representative), about the offset site to DEPI. Any changes to this input information will change the amount of offsets available at the offset site and will require this report to be reissued.

This report should be read in conjunction with the *Native vegetation offset market fact sheet* that provides information on how offsets are measured and categorised, and how they can be used to satisfy conditions on permits to remove native vegetation and traded as credits in the offset market.

**Date of issue:** **21/11/2014** **DEPI ref: EHP_0103**
**Time of issue:** **12:41 PM**

| | |
|---|---|
| **Project ID** | EHP6427_Garfield_OS |

## Summary of offset site

| | |
|---|---|
| **Total extent** | 19.687 ha |
| Remnant patches | 19.687 ha |
| Revegetation | 0 ha |
| **Number of biodiversity class areas (BCAs)** | 4 |
| **Catchment Management Authority and Municipal district** | Port Phillip and Westernport CMA, Cardinia Shire Council |

## Summary of biodiversity equivalence units available at offset site

The offset site has the following general and specific biodiversity equivalence units.

| | |
|---|---|
| **General biodiversity equivalence units** | 0.928 general units* |
| **Specific biodiversity equivalence units** | 2.094 specific units* of habitat for Spotted Gum<br>1.842 specific units* of habitat for Cobra Greenhood<br>2.474 specific units* of habitat for Green Scentbark |

*****Note that some biodiversity equivalence units may be alternates. The use of any biodiversity equivalence units of one type within a BCA will result in a proportional reduction in biodiversity equivalence units of other types within that BCA.

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

# Offset site report

## Offset site details

### Biodiversity equivalence units available and attributes by BCA

The biodiversity equivalence units and attributes for each BCA are as follows:

| BCA | Offset type | Biodiversity equivalence units | Offset attributes |
|---|---|---|---|
| 1 | General | 0.243 general units | 0.242 strategic biodiversity score<br>Port Phillip and Westernport CMA or the local municipal district of the offset site |

| BCA | Offset type | Biodiversity equivalence units | Offset attributes |
|---|---|---|---|
| 2 | General | 0.119 general units | 0.163 strategic biodiversity score<br>Port Phillip and Westernport CMA or the local municipal district of the offset site |
| | Specific | 0.548 specific units | Habitat for 501295, Spotted Gum, Corymbia maculata |
| | Specific | 0.602 specific units | Habitat for 505175, Green Scentbark, Eucalyptus fulgens |

| BCA | Offset type | Biodiversity equivalence units | Offset attributes |
|---|---|---|---|
| 3 | General | 0.159 general units | 0.699 strategic biodiversity score<br>Port Phillip and Westernport CMA or the local municipal district of the offset site |
| | Specific | 0.170 specific units | Habitat for 502798, Cobra Greenhood, Pterostylis grandiflora |
| | Specific | 0.175 specific units | Habitat for 505175, Green Scentbark, Eucalyptus fulgens |

| BCA | Offset type | Biodiversity equivalence units | Offset attributes |
|---|---|---|---|
| 4 | General | 0.407 general units | 0.208 strategic biodiversity score<br>Port Phillip and Westernport CMA or the local municipal district of the offset site |
| | Specific | 1.546 specific units | Habitat for 501295, Spotted Gum, Corymbia maculata |
| | Specific | 1.672 specific units | Habitat for 502798, Cobra Greenhood, Pterostylis grandiflora |
| | Specific | 1.697 specific units | Habitat for 505175, Green Scentbark, Eucalyptus fulgens |

# Offset site report

## Site gain in habitat hectares

Site gain in habitat hectares is calculated for each biodiversity class area (BCA) in the offset site using the extent and site gain per hectare scores in the GIS data provided.

| BCA | Site gain per hectare* | Extent (ha) | Site gain in habitat hectares |
|---|---|---|---|
| 1 | 0.240 | 4.184 | 1.005 |
| 2 | 0.219 | 3.421 | 0.749 |
| 3 | 0.196 | 1.164 | 0.228 |
| 4 | 0.192 | 10.918 | 2.093 |
| **TOTAL** | | | **4.075** |

* This value has been calculated using the site gain per hectare values for each habitat zone as provided with the GIS file of the offset site. The site gain per hectare value for a BCA is calculated from the weighted average of site gain per hectare values for all habitat zones that intersect with the BCA.

## Offset site biodiversity equivalence unit calculations by biodiversity class area

The general biodiversity equivalence units for the biodiversity class area are calculated by multiplying the site gain in habitat hectares by the strategic biodiversity score.

Where a BCA has specific units for one or more rare or threatened species, the specific biodiversity equivalence units for each BCA is calculated by multiplying the site gain in habitat hectares by the habitat importance score for each of these species.

| BCA | Site gain in habitat hectares | Offset type | General offset attributes | Specific offset attributes | | Biodiversity equivalence units* |
|---|---|---|---|---|---|---|
| | | | Strategic biodiversity score | Species number, Species common name, Species scientific name | Habitat importance score | |
| 1 | 1.005 | General | 0.242 | | | 0.243 general units |
| 2 | 0.749 | General | 0.163 | | | 0.119 general units |
| | | Specific | | 501295, Spotted Gum, Corymbia maculata | 0.723 | 0.548 specific units |
| | | Specific | | 505175, Green Scentbark, Eucalyptus fulgens | 0.795 | 0.602 specific units |
| 3 | 0.228 | General | 0.699 | | | 0.159 general units |
| | | Specific | | 502798, Cobra Greenhood, Pterostylis grandiflora | 0.748 | 0.170 specific units |
| | | Specific | | 505175, Green Scentbark, Eucalyptus fulgens | 0.768 | 0.175 specific units |
| 4 | 2.093 | General | 0.208 | | | 0.407 general units |
| | | Specific | | 501295, Spotted Gum, Corymbia maculata | 0.722 | 1.546 specific units |

| BCA | Site gain in habitat hectares | Offset type | General offset attributes | Specific offset attributes | | Biodiversity equivalence units* |
|---|---|---|---|---|---|---|
| | | | Strategic biodiversity score | Species number, Species common name, Species scientific name | Habitat importance score | |
| | | Specific | | 502798, Cobra Greenhood, Pterostylis grandiflora | 0.781 | 1.672 specific units |
| | | Specific | | 505175, Green Scentbark, Eucalyptus fulgens | 0.793 | 1.697 specific units |

*Note that biodiversity equivalence units within a BCA are alternates. The use of any biodiversity equivalence units of one type within a BCA will result in a proportional reduction in biodiversity equivalence units of other types within that BCA.

## Next steps

Offset sites must meet eligibility criteria as outlined in the *Native vegetation gain scoring manual, version 1* available on the DEPI website and any other relevant requirements. Eligible offset sites that are intended to be banked or sold as credits must be registered on the native vegetation credit register. A habitat hectare assessment is required to be undertaken before any offset can be registered on the credit register.

## Appendix 1 – Images of marked native vegetation

**Image 1. Aerial photograph showing marked native vegetation**

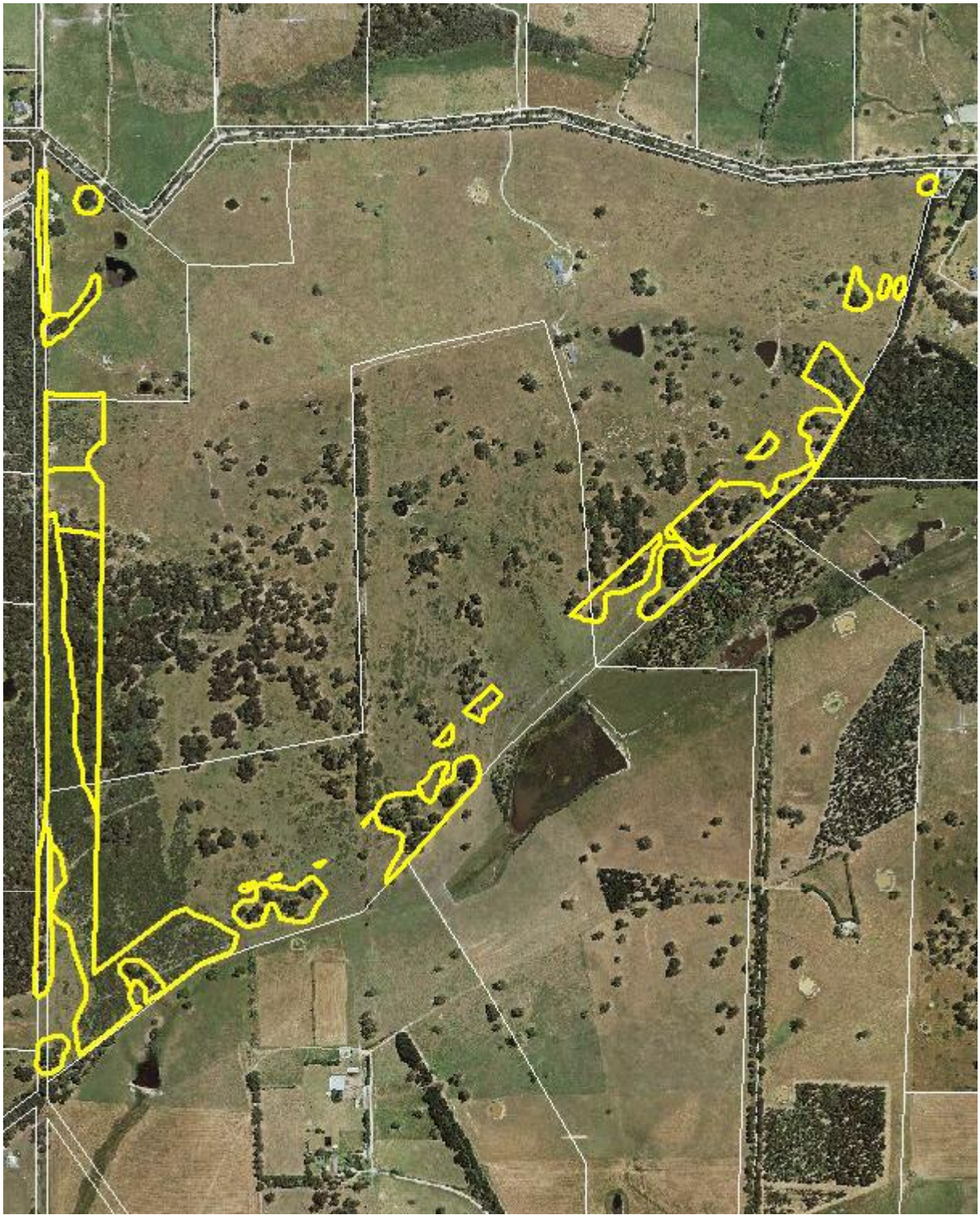


**Image 2. Strategic biodiversity score map**

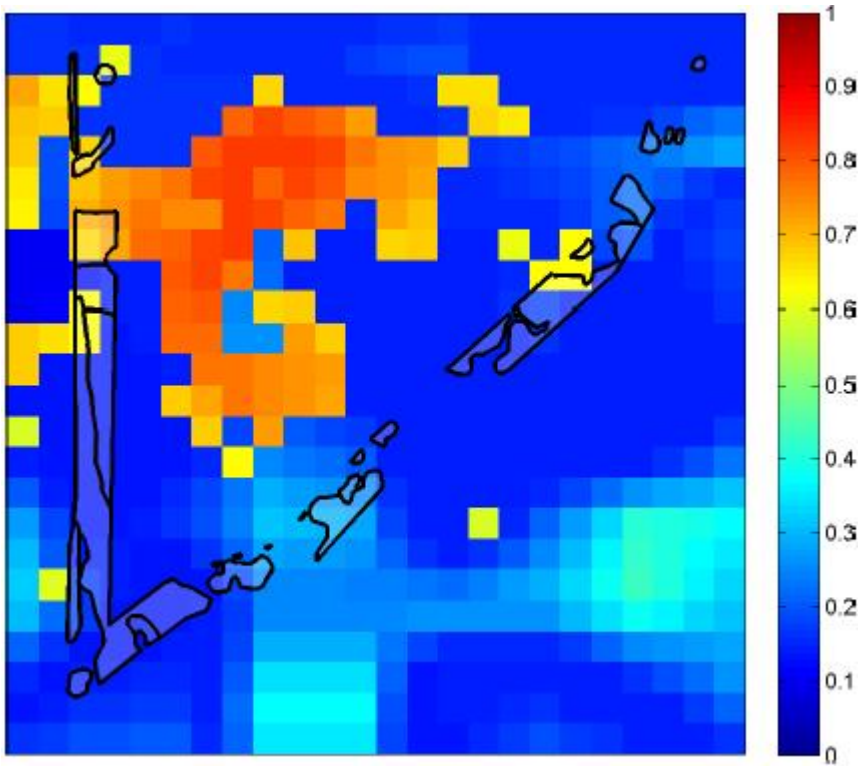



**Image 3. Habitat importance map – 501295, Spotted Gum, Corymbia maculata**

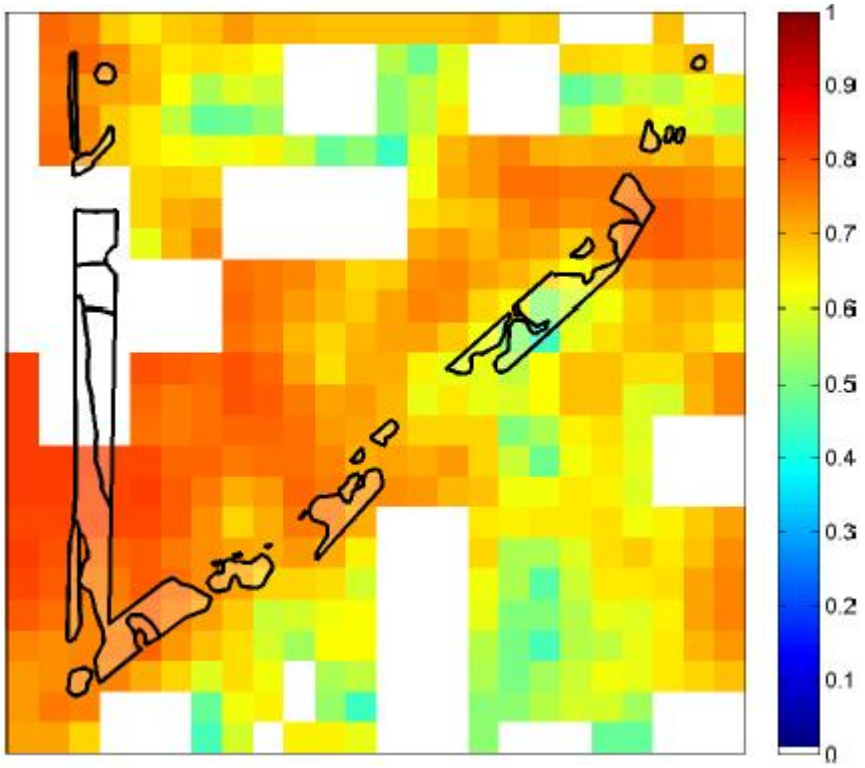


**Image 4. Habitat importance map – 502798, Cobra Greenhood, Pterostylis grandiflora**

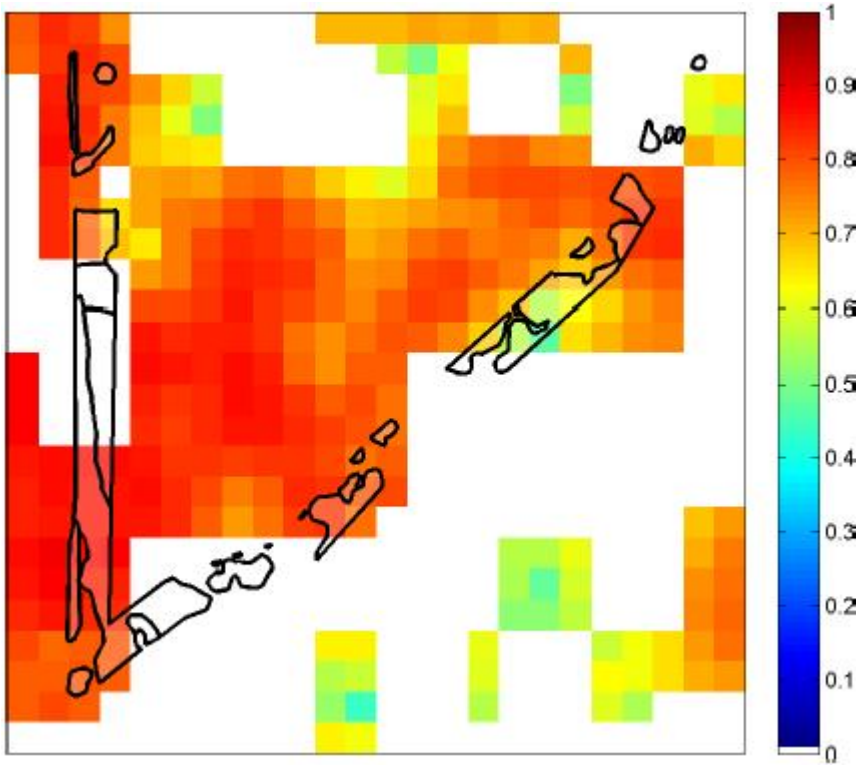
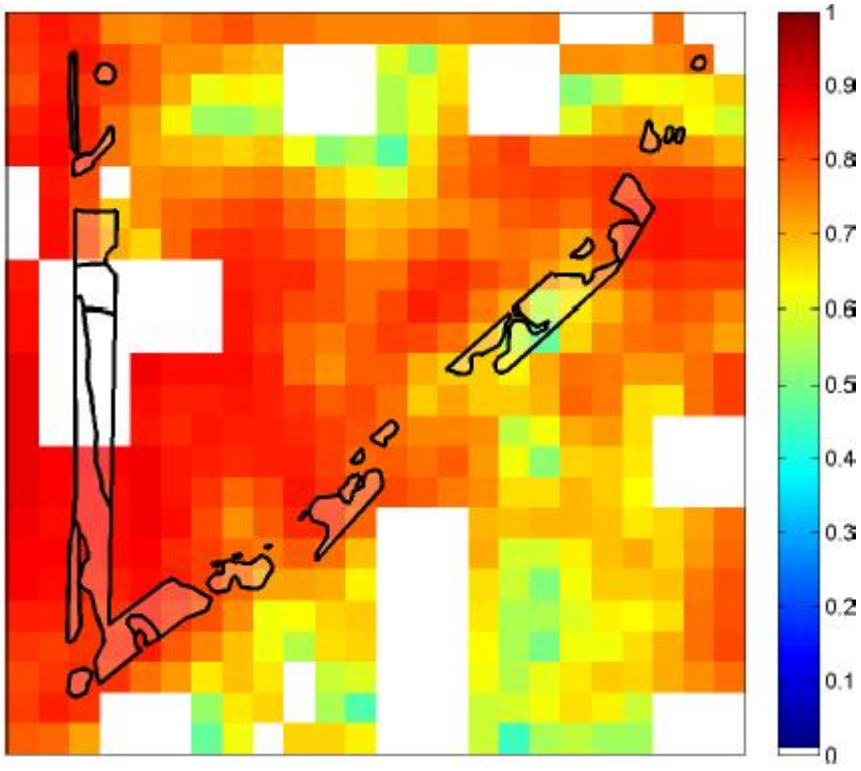



**Image 5. Habitat importance map – 505175, Green Scentbark, Eucalyptus fulgens**



## Glossary

**Alternate offset types**

Offset types within a biodiversity class area (BCA) are alternates. The use of one offset type will result in the proportional reduction of all other offset types within the BCA. For example, in a BCA that has 1 general unit and 2 specific units for a particular rare or threatened species, if all of the general units are used (100 per cent) there will be no specific units remaining, as these specific units will also reduce by 100 per cent. Alternatively, if in this same BCA only half the general units were used (50 per cent) then there will be 0.5 general units and 1 specific units remaining, half the original values.

**Biodiversity Class Area (BCA)**

The BCA is the organisational unit of an offset site. BCAs are determined by the unique combination of general and specific biodiversity equivalence units calculated across the offset site.

**Condition score**

This is the site-assessed condition score for the native vegetation. Each habitat zone in the offset site 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 submitted for processing.

**General biodiversity equivalence units (general units)**

The general biodiversity equivalence units (general units) quantify the relative overall contribution that the protection and management of native vegetation at the offset site makes to Victoria's biodiversity. The general biodiversity equivalence units is calculated as follows:

$$\textit{General biodiversity equivalence units} = \textit{site gain in habitat hectares} \times \textit{strategic biodiversity score}$$

**General offset attributes**

The attributes of a general offset site must match those in an offset reuqirement that is a condition on a permit to remove native vegeaiotn, in order for that offset site to be used to satisfy the permit condition. General offsets 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 clearing site. The strategic biodiversity score of a general offset is determined by the biodiversity class area the units are sold from.

**Habitat importance score**

The habitat importance score is a measure of the relative importance of the habitat located on a site for a particular rare or threatened species, compared to all other habitat for that 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 biodiversity class area where the habitat importace map indicates that species habitat occurs and where the protection of habitat across the offset agreement is greater than the threshold test.

**Habitat zone**

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

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

**Offset type**

There are two types of offsets, general offset and specific offsets. All offset sites can be general offsets. Sites that are mapped as habitat for specific rare or threatened species can be specific offsets for those species habitat.

**Site gain in habitat hectares**

Site gain in habitat hectares is a site-based measure that combines extent and site gain per hectare of native vegetation at an offset site. The site gain in habitat hectares measures both the current status of native vegetation at a site and the potential site gain from the protection and management of the native vegetation at that site. The condition of a site, or the gain in condition due to protection and management actions are multiplied by the extent (area in hectares) of native vegetation to calculate the site gain in habitat hectares value. For a biodiversity class area the site gain in habitat hectares is determined using the following formula:

$$\textit{Site gain in habitat hectares} = \textit{total extent}\ (\textit{hectares}) \times \textit{site gain per hectare}$$

**Site gain per hectare**

This is the site-assessed gain per hectare for the native vegetation based on the agreed management and security commitments. Each habitat zone in the offset proposal is assigned a site gain per hectare according to the habitat hectare assessment and gain scoring methods. This is a number between 0 and 1. This information has been provided by or on behalf of the applicant in the GIS file. These values are aggregated to the level of the BCA in order to calculate offset amounts at the offset site.

**Specific offset attributes**

The attributes of a speicfc offset site must match those in an offset reuqirement that is a condition on a permit to remove native vegetation, in order for that offset site to be used to satisfy the permit condition. Specific offsets must be located in the mapped habitat for the species that has triggered the specific offset requirement.

**Specific biodiversity equivalence units (specific units)**

Specific biodiversity equivalence units (specific units) are associated with a particular rare or threatened species habitat. The specific biodiversity equivalence units quantifies the relative overall contribution that the protection and management of native vegetation at an offset site makes to the habitat of the relevant rare or threatened species. Specific units are calculated for each species in each biodiversity class area where the result of the threshold test is greater than 0.0025 per cent. Specific units are calcualted as follows:

$$\textit{Specific biodiversity equivalence units}_{\textit{species x}} = \textit{site gain in habitat hectares} \times \textit{habitat importance score}_{\textit{species x}}$$

**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 BCA.

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.

**Threshold test**

By default, a threshold test is applied to offset sites to limit the number of rare or threatened species for which specific biodiversity equivalence units are calculated. This is done to make organising and trading credits more manageable. The test determines if the offset site can generate specific habitat protection for any rare or threatened species above a threshold. The threshold is set at 0.0025 per cent of the total habitat for a species. When the proportion of habitat protected is above the threshold, specific biodiversity equivalence units are calculated for that species.

# Offset site report

**Total extent (hectares) for calculating site gain in habitat hectares**

This is the total area of offset site native vegetation in hectares.

The total extent of native vegetation is an input to calculating the site gain in habitat hectares at a site and in calculating the total gain in general and specific biodiversity equivalence units.