

MANZEENE AVENUE, LARA
BASELINE OFFSET MONITORING REPORT–
WARRAMBEEN OFFSET SITE

Manzeene Avenue Development Project Trust



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1. INTRODUCTION

Manzeene Avenue Development Project Trust Pty Ltd engaged BL&A to conduct an annual offset monitoring survey of a 30 hectare area of land at Warrambeen Estate, Shelford; a property subject to an offset monitoring plan.

This investigation was commissioned to provide baseline data of the offset site, including the condition of native vegetation, extent of weed invasion in the study area and the adequacy of fencing and grazing regimes. This report provides baseline data to be used in the monitoring and adaptive management of the offset site under Victoria's *Biodiversity assessment guidelines* (DEPI 2013), herein referred to as the 'Guidelines' and the EPBC Act Environmental Offsets Policy (DSEWPaC, 2012).

Specifically, the scope of the investigation included:

- Estimation of overall weed cover and cover of each high threat [woody] weed species (refer to Table 11 of OMP; BL&A 2015);
- Establishment of photo points;
- Assessment of integrity of offset zone fencing;
- Assessment of level of grazing pressure;
- Monitoring of compliance with land-use commitments and other management commitments; and
- Monitoring of quality of NTGVVP.

This report is divided into the following sections:

Section 2 provides an overview of the characteristics of the study area and describes the sources of information including the background to the project.

Section 3 describes the methods used for the field survey and monitoring.

Section 4 presents the investigation results, describing the flora and fauna of the study area.

Section 5 discusses the implications of the management plan implementation, analysis of results and recommendations to improve the management process.

This investigation was undertaken by a team from BL&A, comprising Rani Sherriff (Botanist), Elinor Ebsworth (Ecologist) and Inga Kulik (Senior Ecologist & Project Manager).

2. SITE DESCRIPTION AND BACKGROUND

2.1. Site Description

The 30 ha offset site to which this report applies (Figure 1) is located on a large property along the Rokewood-Shelford Road, Shelford. The offset property is known as Warrambeen Gumley Land Trust and is located approximately 50 kilometres north west of Geelong. The offset property is bordered by Rokewood Shelford Road to the south, Lonies Road to the east and Gumley Mount Mercer Road to the west. The offset property operates as a sheep station as it has done for an extended period of time.

Large areas of native grassland exist in the area. The landowner of the offset property has indicated that there are over 500 hectares (including the offset sites) of native grassland within the Warrambeen Gumley Land Trust alone (Landowners, *pers. comm.* 2010).

The offset site lies within the Victorian Volcanic Plain bioregion and fall within the Corangamite catchment.

2.2. Background

This project was commissioned by Manzeene Avenue Development Project Trust Pty Ltd to provide baseline data for the study area which is proposed to be used for native vegetation offset credits. The offset site is a requirement for the construction of the proposed Manzeene Village Development at Lara, under the Victorian *Biodiversity assessment guidelines* (DEPI 2013) and *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*. The offset monitoring will include assessment against the requirements detailed by the offset management plan produced by Brett Lane & Associates (BL&A 2015).

The offset site within the Warrambeen property is proposed to be secured as offset by Manzeene Avenue Development Project Trust Pty Ltd under Section 173 of the *Planning and Environment Act 1987*. The requirement of the Offset Security Agreement between Manzeene Avenue Development Project Trust Pty Ltd, City of Greater Geelong and the Landowners, will be to undertake annual monitoring at the offset site for a period of 10 years.

Offset Management Plan

The following assessments were undertaken by BL&A to establish baseline data under the offset management plan:

- Flora surveys by a qualified Botanist, documenting the overall vegetation condition and percentage cover for weed species;
- Assessment of mapped vegetation against the criteria for the EPBC Act listed community *Natural Temperate Grasslands of the Victorian Volcanic Plain* (NTGVVP); and
- Liaise with key stakeholders.

The offset management plan outlined the following management actions which need to be undertaken:

- *Pest Plant Control:* Herbaceous weed control to be undertaken regularly throughout the year using spot spraying technique. Focus on elimination of woody weeds and high threat herbaceous weeds;
- *Pest Animal Control:* Monitor for signs of pest animal activity, taking action where required;
- *Access:* Regularly check integrity of fencing throughout the life of the management plan;
- *Biomass Control:* Strategically graze the study area (in winter if dry), generally spelling in spring/summer to maintain and enhance a herb-rich open ground cover and significant species populations every year. Avoid grazing in any ephemerally wet areas.
- *Monitoring:* Regularly monitor composition and trends of vegetation to assess management effectiveness and guide future management actions. Monitoring will occur each year, with a brief report prepared every two years, and a more detailed monitoring plan at the end of year five and year 10. This report establishes baseline data for the annual monitoring program.

Methods employed to address the offset management plan requirements are presented in Table 1.

3. METHODS

3.1. Field methodology

The habitat hectare and weed-cover assessment were conducted on 12th February 2015 and the baseline offset monitoring was undertaken on the 10th December 2015. During this assessment, the areas supporting remnant native vegetation were inspected on foot.

Incidental records of threatened flora species were taken within all vegetation types, landforms and quadrat surveys whilst undertaking the habitat hectare and weed cover assessments. Specimens requiring identification using laboratory techniques were collected.

Photo points were established in March 2016.

3.2. Offset management actions

BL&A have reviewed the offset management plan to ensure that the proposed methods, discussed below, correspond to the requirements of the offset management plans.

The management actions include:

- Access control and fencing;
- Biomass reduction;
- Pest plant control;
- Pest animal control; and
- Protection of significant flora and fauna.

Table 1 details the broad methods used for the offset site monitoring.

Based on this the following surveys were undertaken, discussed in the sections below:

- Habitat hectare assessment (including documentation of the introduced flora species occurring in the offset site); and
- Photo point establishment.

Table 1: Monitoring methods

Monitoring Actions	Relevant Performance measures (as per management plan)	Monitoring method
Access control and fencing	Maintenance of existing fencing	Visual inspection to determine the condition of the fence
Biomass reduction	Appropriate stock grazing	Discussions with Ian Taylor as to how stock was managed throughout the year (including when the grassland was rested from grazing)
	Maintenance of NTGVVP	Monitoring of vegetation to determined qualification as NTGVVP
Pest plant control	No increase in cover of any weed species	Visual inspection of site and through habitat hectare assessment
	No new weed species introduced	Visual inspection of site and through habitat hectare assessment
Pest animal control	Reduce the number of rabbits	Discussions with Ian Taylor as to how pest animals have been controlled
	Identify all rabbit warrens	Visual Inspection

3.2.1. Habitat hectare and weed cover assessment

Native vegetation is assessed using the habitat hectare method, which is a DELWP approved vegetation quality assessment method. Native vegetation is currently 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 2013):

- Remnant patch; or
- Scattered trees.

The definitions of these categories are provided below, along with the prescribed DELWP 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 trees¹ where the canopy foliage cover² 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.

Scattered trees

The *Biodiversity assessment guidelines* define scattered trees as a native canopy tree² 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.

The percentage cover of each weed species present within the offset site was recorded during the habitat hectare assessment. The condition of fencing and evidence of pest animals was also recorded at this time.

3.2.2. Photo point establishment

Photo monitoring points were established (see Figure 2), to represent the vegetation types within the study area. Four monitoring points were established.

The points were randomly selected in each of the vegetation types. A metal stake was placed at each point and a GPS waypoint taken for each location. A photograph was taken from the northern side of the stake facing directly south, at a distance of

¹ 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.

² Foliage cover is the proportion of the ground that is shaded by vegetation foliage when lit from directly above.

approximately one metre. Approximately ten centimetres of the top of the stake was included in each photo to give a reference for each photograph.

The photographs taken from each point are included in Appendix 1.

3.3. Limitations of field assessment

The temporally constrained nature of the field assessments can result in a failure to record all species and life-forms because of the seasonal absence of some species. However, this limitation was not considered to undermine the current investigation, which was designed to provide an indicative, rather than exhaustive inventory of species in the study area.

The survey was undertaken in late summer, which is adequate to assess most of the features of this community. The site is undoubtedly of very high quality and conservation value; however, the suite of bulbous species such as lilies and orchids were absent during this survey, since they would be only detectable in spring.

4. ASSESSMENT RESULTS

4.1. Habitat hectare assessment

4.1.1. Habitat hectares

Evidence on site, including floristic composition and soil characteristics, suggested that *Heavier-soils Plains Grassland* Heavier Soils (EVC 132_61) was present within the study area (Figure 1).

Heavier-soils Plains Grassland (EVC 132_61) is described in the benchmark as “treeless vegetation mostly less than 1 m tall dominated by largely graminoid and herb life forms. Occupies fertile cracking basalt soils prone to seasonal waterlogging in areas receiving at least 500 mm annual rainfall” (see Appendix 3).

One remnant patch (referred to herein as offset zone A (see Figure 1) comprising the abovementioned EVC is pertinent to this report (Table 2).

Table 2: Description of offset zone

Offset Zone	Bioregion	EVC	Description
A	VVP	<i>Heavier-soils Plains Grassland</i> (EVC 132_61) NTGVVP	A large continuous patch of very high quality native grassland that was dominated by a number of indigenous grasses and herbs. Tussock grasses, Kangaroo grass and Spear grass species were co-dominant across the area, with native herbs such as Lemon Beauty Heads, Blue Devil, Pale Everlasting and Small Scurf-pea common and widespread throughout the entire site. Three listed flora species were recorded in the zone, and more are considered likely to occur. Recruitment area was moderately low, with moderately high litter presence. The area was gently undulating, with a number of basalt rocky rises. Introduced species were present, although they contributed a reasonably low cover. High threat weeds were dominant amongst introduced species.

The habitat hectare assessment results for these habitat zones are provided in Table 3. More detailed habitat scoring results are presented in Appendix 2.

Table 3: Summary of habitat hectare assessment results

Offset Zone	EVC	Area (ha)	Habitat Score (out of 100)	Habitat Hectare (Hha)
A	Heavier-soils Plains Grassland (EVC 132_61)	30	71	21.3

4.1.2. Threatened species

The analysis within the OMP (BL&A 2015) indicated that the following listed flora species are likely to occur or have the potential to occur:

- Clover Glycine (Vulnerable – EPBC Act).
- Spiny Rice-flower (Critically endangered – EPBC Act).

One flora species listed under the FFG Act was recorded during the field survey, Small Scurf Pea.

4.1.3. Access control and fencing

The current fencing is of good quality and should be maintained over the years to retain this standard. A fence surrounds the 195 hectare paddock, of which the offset site forms a portion, and no additional fence between different offset parties is required (as per BL&A 2015).

4.1.4. Pest animal monitoring

Rabbit numbers on the offset site are currently limited. Notwithstanding this, regular control of rabbits is warranted. Controls should be carried out by warren fumigation, shooting and ripping, as well as the removal of harbour (shelter). This, however, does not include scattered surface rock, which provides potential habitat for Striped Legless Lizard.

4.1.5. Pest plant monitoring

Weed species including Spear Thistle, Squirrel-tail Fescue, Oat and Large Quaking Grass contribute approximately 20% vegetation cover in the offset site. Under the offset plan (BL&A 2015), to achieve site gain all weeds are required to be controlled such that their cover does not increase beyond the current level. In addition to this, there are obligations for land managers under the Catchment and Land Protection Act 1994 with respect to eradicating regionally prohibited weeds and preventing the growth and spread of regionally controlled weeds. The pest plant species recorded on-site and their percentage cover at the time of baseline survey are included in Table 4.

Table 4: Pest plant baseline data

Common Name	Scientific name	Weed Category	Control requirement		Current % Cover
			Control under CaLP Act	Control under offset plan - Ensure cover does not increase beyond current level	
Buck's-horn Plantain	<i>Plantago coronopus</i>	Other weed		X	<1%
Cat's Ear	<i>Hypochoeris radicata</i>	Other weed		X	1-5%
Common Centaury	<i>Centaureum erythraea</i>	Other weed		X	<1%
Hare's-foot Clover	<i>Trifolium arvense var. arvense</i>	Other weed		X	<1%
Horehound	<i>Marrubium vulgare</i>	High-threat weed	X	X	<1%
Large Quaking-grass	<i>Briza maxima</i>	Other weed		X	1-5%
Oat	<i>Avena sativa</i>	Other weed		X	<1%
Onion Grass	<i>Romulea rosea</i>	Other weed		X	1-5%
Rough Sow-thistle	<i>Sonchus asper s.l.</i>	Other weed		X	<1%
Saffron Thistle	<i>Carthamus lanatus</i>	Other weed		X	<1%
Serrated Tussock	<i>Nassella trichotoma</i>	High-threat weed	X	X	<1%
Spear Thistle	<i>Cirsium vulgare</i>	High-threat weed		X	10%
Squirrel-tail Fescue	<i>Vulpia bromoides</i>	Other weed		X	1-5%
Wimmera Rye-grass	<i>Lolium rigidum</i>	Other weed		X	<1%

4.1.1. Qualification as NTGVVP

The entirety of the offset site qualified as *Natural Temperate Grasslands of the Victorian Volcanic Plain* (NTGVVP) at the time of baseline survey as it met all the diagnostic features and two of the three condition thresholds from the listing advice (TSSC 2008), as detailed in Table 5.

Table 5: Qualification of offset site at NTGVVP

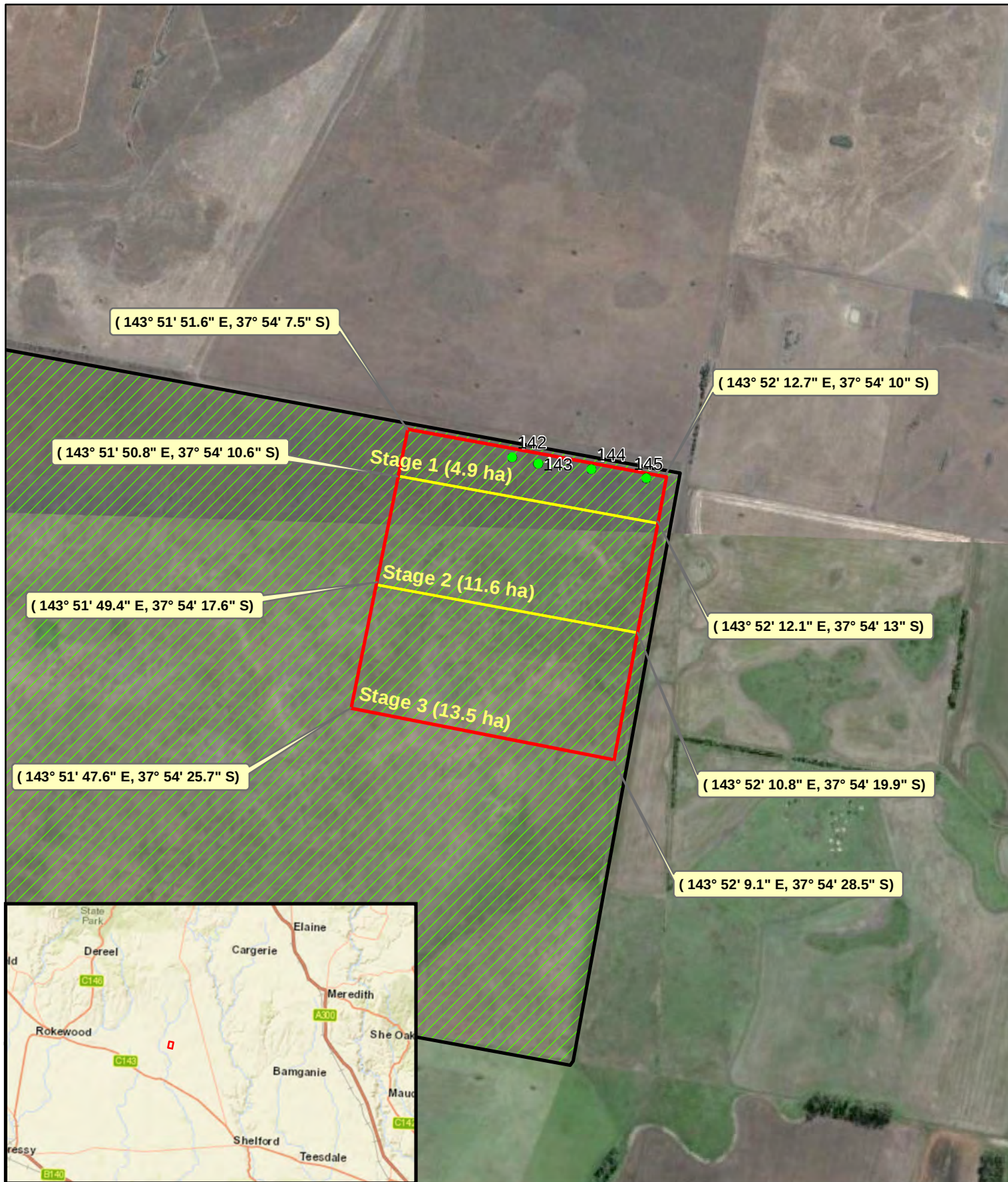
NTGVVP key diagnostic features (must meet all)	
Quaternary basalt soils within the Victorian Volcanic Plain bioregion.	Yes
At least one of the following grass genera is the dominant native species in the ground layer: Kangaroo-grass, Wallaby-grass, Spear-grass and/or Tussock-grass.	Yes
For a native vegetation remnant >1 hectare in size, the minimum contiguous size of a grassland patch is 0.5 hectare and the density of mature trees within the grassland patch should not exceed 2 trees per hectare.	Yes
NTGVVP condition thresholds (must meet at least one)	
The total perennial tussock cover represented by the native grass genera Kangaroo-grass, Wallaby-grass, Spear-grass and/or Tussock-grass is at least 50%.	Yes
The ground cover of native forbs (wildflowers) is at least 50% of total vegetation cover during spring-summer (September to February).	No
The cover of non-grass weeds is less than 30% of total vegetation cover at any time of the year.	Yes

4.2. Photo point establishment

The results of the photo points are shown in Appendix 1. Results include the indigenous and introduced flora species detected, litter, rock and bare ground percentage covers, height of vegetation and presence of high threat weeds. Photo monitoring points were taken in the area of Stage 1.

4.3. Onsite Management Practices

As the current report documents the baseline data for the offset site, no onsite management practices have yet been undertaken. Onsite Management Practices for each year are documented in the OMP (BL&A 2015).



Legend

- Offset site
- Property boundary
- Stages
- Plains Grassland/ NTGVVP
- Photo points

0 165 330 660 Metres

Figure 1: Offset Site

Project: Warrambeen Offset Site

Client: Manzeene Avenue Development Project Trust

Project No.: 13029

Date: 30/05/2016

Created By: M. Ghasemi / I. Kulik

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5. REFERENCES

- Brett Lane & Associates (BL&A) 2015, *Manzeene Avenue, Lara – Offset Management Plan* Report No. 11212 (4.4), prepared for Manzeene Avenue Development Project Trust.
- Department of Environment and Primary Industries (DEPI) 2013, *Permitted clearing of native vegetation: Biodiversity assessment guidelines* (dated September 2013), Department of Environment and Primary Industries, East Melbourne, Victoria.
- Department of Sustainability, Environment, Water, Populations and Communities (DSEWPac) 2012, *Environmental Protection and Biodiversity Conservation Act 1999 – Environmental Offsets Policy*, Canberra, October 2012.
- Department of Sustainability and Environment (DSE) 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 and Environment, East Melbourne, Victoria.
- Threatened Species Scientific Committee (TSSC) 2008, *Commonwealth Listing Advice on Natural Temperate Grassland of the Victorian Volcanic Plain*, Department of the Environment, Canberra.

Appendix 1: Photo-point monitoring locations

Quadrat/Photo No.	Photograph		Location	WP #	Notes
142				Stage 1	37° 54' 09" S, 143° 52' 02" E
142				Stage 1	37° 54' 09" S, 143° 52' 02" E
					Habitat Zone A EVC: <i>Heavier Soils</i> Plains Grassland (132_61)
					Habitat Zone A EVC: <i>Heavier Soils</i> Plains Grassland (132_61)

Quadrat/Photo No.	Photograph	Location	WP #	Notes
143		Stage 1	37° 54' 09" S, 143° 52' 02" E	Habitat Zone A EVC: <i>Heavier Soils</i> Plains Grassland (132_61)
143		Stage 1	37° 54' 09" S, 143° 52' 02" E	Habitat Zone A EVC: <i>Heavier Soils</i> Plains Grassland (132_61)

Quadrat/Photo No.	Photograph	Location	WP #	Notes
144		Stage 1	37° 54' 09" S, 143° 52' 06" E	Habitat Zone A EVC: <i>Heavier Soils</i> Plains Grassland (132_61)
144		Stage 1	37° 54' 09" S, 143° 52' 06" E	Habitat Zone A EVC: <i>Heavier Soils</i> Plains Grassland (132_61)

Quadrat/Photo No.	Photograph	Location	WP #	Notes
145		Stage 1	37° 54' 10" S, 143° 52' 11" E	Habitat Zone A EVC: <i>Heavier Soils</i> Plains Grassland (132_61)
145		Stage 1	37° 54' 10" S, 143° 52' 11" E	Habitat Zone A EVC: <i>Heavier Soils</i> Plains Grassland (132_61)

Appendix 2: Detailed habitat hectare assessment results

Habitat Zone			A (Feb 2015)	Stage 1 (Dec 15)	Stage 2 (Dec 15)	Stage 3 (Dec 15)
Bioregion			VVP	VVP	VVP	VVP
EVC Number			132_61	132_61	132_61	132_61
Total area of Habitat Zone (ha)			30.000	4.900	11.600	13.500
Site Condition	Large Old Trees	/10	0	0	0	0
	Tree Canopy Cover	/5	0	0	0	0
	Lack of Weeds	/15	7	6	9	6
	Understorey	/25	25	15	15	25
	Recruitment	/10	3	6	6	6
	Organic Matter	/5	5	3	3	5
	Logs	/5	0	0	0	0
	Site condition standardising multiplier*		1.36	1.36	1.36	1.36
	Site Condition subtotal		54	41	45	57
Landscape Context	Patch Size	/10	8	8	8	8
	Neighbourhood	/10	4	4	4	4
	Distance to Core	/5	5	5	5	5
Total Habitat Score		/100	71	58	62	74
Habitat score out of 1			0.71	0.58	0.62	0.74
Habitat Hectares in Habitat Zone#			21.300	2.842	7.192	9.990

= Habitat hectares = habitat score (out of 1) x area in zone; * = Modified approach to habitat scoring - refer to Table 14 of DSE's Vegetation Quality Assessment Manual (DSE, 2004)

Appendix 3: EVC Benchmarks

- EVC 132_61 (*Heavier Soils Plains Grassland*) – **WP**

EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 132_61: *Heavier-soils* Plains Grassland

Description:

Treeless vegetation mostly less than 1 m tall dominated by largely graminoid and herb life forms. Occupies fertile cracking basalt soils prone to seasonal waterlogging in areas receiving at least 500 mm annual rainfall.

Life Forms:

Life form	# Spp	% Cover	LF code
Large Herb	2	5%	LH
Medium Herb	12	20%	MH
Small or Prostrate Herb	4	5%	SH
Large Tufted Graminoid	1	5%	LTG
Medium to Small Tufted Graminoid	13	40%	MTG
Medium to Tiny Non-tufted Graminoid	4	5%	MNG
Bryophytes/Lichens and Soil Crust*	na	20%	BL

* Note: treat as one life form in this EVC

LF Code	Species typical of at least part of EVC range	Common Name
SS	<i>Pimelea humilis</i>	Common Rice-flower
LH	<i>Rumex dumosus</i>	Wiry Dock
MH	<i>Calocephalus citreus</i>	Lemon Beauty-heads
MH	<i>Acaena echinata</i>	Sheep's Burr
MH	<i>Leptorhynchus squamatus</i>	Scaly Buttons
MH	<i>Eryngium ovium</i>	Blue Devil
SH	<i>Solenogyne dominii</i>	Smooth Solenogyne
SH	<i>Lobelia pratioides</i>	Poison Lobelia
LTG	<i>Austrostipa bigeniculata</i>	Kneed Spear-grass
LTG	<i>Dichelachne crinita</i>	Long-hair Plume-grass
MTG	<i>Themeda triandra</i>	Kangaroo Grass
MTG	<i>Austrodanthonia caespitosa</i>	Common Wallaby-grass
MTG	<i>Elymus scaber</i> var. <i>scaber</i>	Common Wheat-grass
MTG	<i>Schoenus apogon</i>	Common Bog-sedge
MNG	<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass
MNG	<i>Thelymitra pauciflora</i> s.l.	Slender Sun-orchid
MNG	<i>Microtis unifolia</i>	Common Onion-orchid
SC	<i>Convolvulus erubescens</i>	Pink Bindweed

Recruitment:

Episodic/Fire or Grazing. Desirable period between disturbances is 5 years.

Organic Litter:

10% cover

EVC 132_61: *Heavier-soils* Plains Grassland - Victorian Volcanic Plain bioregion

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
LH	<i>Plantago lanceolata</i>	Ribwort	high	low
LH	<i>Cirsium vulgare</i>	Spear Thistle	high	high
LH	<i>Sonchus oleraceus</i>	Common Sow-thistle	high	low
MH	<i>Hypochoeris radicata</i>	Cat's Ear	high	low
MH	<i>Leontodon taraxacoides</i> ssp. <i>taraxacoides</i>	Hairy Hawkbit	high	low
MH	<i>Trifolium subterraneum</i>	Subterranean Clover	high	low
MH	<i>Plantago coronopus</i>	Buck's-horn Plantain	high	low
MH	<i>Trifolium striatum</i>	Knotted Clover	high	low
MH	<i>Trifolium dubium</i>	Suckling Clover	high	low
LTG	<i>Phalaris aquatica</i>	Toowoomba Canary-grass	high	high
LNG	<i>Holcus lanatus</i>	Yorkshire Fog	high	high
MTG	<i>Romulea rosea</i>	Onion Grass	high	low
MTG	<i>Vulpia bromoides</i>	Squirrel-tail Fescue	high	low
MTG	<i>Briza minor</i>	Lesser Quaking-grass	high	low
MTG	<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	Soft Brome	high	low
MTG	<i>Briza maxima</i>	Large Quaking-grass	high	low
MTG	<i>Lolium rigidum</i>	Wimmera Rye-grass	high	low
MTG	<i>Lolium perenne</i>	Perennial Rye-grass	high	low
MTG	<i>Nassella neesiana</i>	Chilean Needle-grass	high	high
MNG	<i>Cynosurus echinatus</i>	Rough Dog's-tail	high	low
MNG	<i>Juncus capitatus</i>	Capitate Rush	high	low

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