

MANZEENE AVENUE, LARA

OFFSET MANAGEMENT PLAN

Manzeene Avenue Development Project Trust



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1. INTRODUCTION

Manzeene Avenue Development Project Trust Pty Ltd engaged Brett Lane & Associates (BL&A) to produce an Offset Management Plan for an offset site at Warrambeen Estate, Shelford to account for the planned clearing of native vegetation for the proposed Manzeene Village Development at Lara. The vegetation to be cleared includes 18 patches of Plains Grassland (EVC 132_63) totaling 17.69 hectares in area within the Victorian Volcanic Plain bioregion. Twelve patches totalling 9.97 hectares of the Grassland vegetation to be removed are classified as *Natural Temperate Grassland of the Victorian Volcanic Plain* (NTGVVP) under the EPBC Act. This site was previously assessed by Brett Lane & Associates Pty Ltd in January 2012 (BL&A 2013).

A brief overview of the area proposed for clearing is provided in this report including quantified vegetation loss and legal obligations to offset that loss. This report also details the extent, condition and available gain at the proposed offset site at Warrambeen Estate, Shelford. A different offset site at Warrambeen Estate (detailed in BL&A Report 11212 (4.4)) was originally proposed. The new offset site (detailed in the current report) has been chosen in consultation with the landowner and Manzeene Avenue Development Project Trust Pty Ltd since it lies adjacent to existing offset sites and is more practicable for the landowner.

This offset plan provides details of the following:

- Strategies and targets for weed control;
- Outline of management actions and targets;
- Methods of offset protection;
- Persons responsible for implementing and monitoring; and
- Timeframes for implementing the offset plan.

These directions are consistent with the requirements of current planning practice according to Victoria's *Biodiversity assessment guidelines* (DEPI 2013a), herein referred to as the 'Guidelines' and the EPBC Act Environmental Offsets Policy (DSEWPaC, 2012).

Section 2 is an assessment of the suitability of the proposed offset site. It includes details about the approved clearing, Like-for-Like criteria and gain calculations.

Section 3 describes how the offset is to be implemented. It includes details about landowner commitments, management activities, monitoring and reporting. It is intended to be placed on-title.

This offset management plan was prepared by a team from Brett Lane & Associates Pty Ltd, comprising Elinor Ebsworth (Ecologist) and Inga Kulik (Senior Ecologist & Project Manager).

2. OFFSET SUITABILITY (PART A)

Table 1: Clearing site details

Landowner of clearing site	Manzeene Avenue Development Project Trust P/L
Location and address of clearing site	Manzeene Avenue and adjoining properties on Kees Road and Patullos Road, Lara
Local Government Area	City of Greater Geelong
Catchment Management Authority	Corangamite
Responsible Authority	Corangamite Shire
Permit applicant	Manzeene Avenue Development Project Trust P/L
Planning Permit Number (ID)/Work Authority Number	Permit No 464/2014
Date approved	24 th November 2014

2.1. Vegetation approved for removal

Details about the vegetation removal at the property and required offset targets are provided below in Table 2.

The critically endangered NTGVVP ecological community listed under the EPBC Act will be impacted by the vegetation removal.

Table 2: Summary of losses and Gain targets of patches of native vegetation

Habitat Zone	A	B	C	D	E	F	G	H	I
Bioregion	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number	132_61	132_61	132_61	132_61	132_61	132_61	132_61	132_61	132_61
Habitat Score (out of 1)	0.197	0.278	0.278	0.251	0.278	0.278	0.292	0.197	0.278
Habitat Zone area to be cleared (ha)	0.127	0.484	1.266	0.165	0.247	0.649	0.137	1.308	0.097
Habitat Hectares of loss	0.025	0.135	0.352	0.041	0.069	0.181	0.040	0.257	0.027
General BEUs of Loss	0.022	0.116	0.304	0.036	0.019	0.118	0.035	0.097	0.024
Specific BEUs lost	0	0	0	0	0	0	0	0	0
Net Gain Multiplier	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Gain Target BEUs	0.033	0.174	0.456	0.054	0.0285	0.177	0.0525	0.1455	0.036
Minimum SBS	0.580	0.580	0.580	0.580	0.580	0.580	0.580	0.580	0.580
EPBC Listed Ecological Community		NTGVVP			NTGVVP	NTGVVP	NTGVVP		NTGVVP
Area of community (ha)		0.484			0.247	0.649	0.137		0.097
Area to be removed (ha)		0.484			0.247	0.649	0.137		0.097
Estimated Gain Target (x4 ha)		1.936			0.988	2.596	0.548		0.388

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

Habitat Zone	J	K	L	M	N	O	P	Q	R
Bioregion	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number	132_61	132_61	132_61	132_61	132_61	132_61	132_61	132_61	132_61
Habitat Score (out of 1)	0.278	0.278	0.319	0.278	0.319	0.319	0.251	0.278	0.374
Habitat Zone area to be cleared (ha)	0.693	0.057	2.114	1.006	1.153	0.593	0.474	1.088	1.533
Habitat Hectares of loss	0.193	0.016	0.675	0.280	0.368	0.189	0.119	0.303	0.573
General BEUs of Loss	0.17	0.014	0.567	0.172	0.043	0.311	0.167	0.104	0.264
Specific BEUs lost	0	0	0	0	0	0	0	0	0
Net Gain Multiplier	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Gain Target BEUs	0.255	0.021	0.8505	0.258	0.0645	0.4665	0.2505	0.156	0.396
Minimum SBS	0.580	0.580	0.580	0.580	0.580	0.580	0.580	0.580	0.580
EPBC Listed Ecological Community			NTGVVP	NTGVVP	NTGVVP	NTGVVP			NTGVVP
Area of community (ha)			2.114	1.006	1.153	0.593			1.533
Area to be removed (ha)			2.114	1.006	1.153	0.593			1.533
Estimated Gain Target (x4 ha)			8.456	4.024	4.612	2.372			6.132

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

Habitat Zone	S	T	U	V	W	X	Y	Total
Bioregion	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number	132_61	132_61	132_61	132_61	132_61	132_61	132_61	132_61
Habitat Score (out of 1)	0.251	0.224	0.197	0.319	0.278	0.306	0.346	
Habitat Zone area to be cleared (ha)	1.187	0.154	0.297	0.585	0.904	0.174	1.194	17.679
Habitat Hectares of loss	0.298	0.034	0.058	0.187	0.252	0.053	0.414	5.153
General BEUs of Loss	0.472	0.205	0.009	0.007	0.019	0.219	0.288	3.803
Specific BEUs lost	0	0	0	0	0	0	0	0
Net Gain Multiplier	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
Gain Target BEUs	0.708	0.3075	0.0135	0.0105	0.0285	0.3285	0.432	5.704
Minimum SBS	0.580	0.580	0.580	0.580	0.580	0.580	0.580	0.580
EPBC Listed Ecological Community				NTGVVP		NTGVVP	NTGVVP	
Area of community (ha)				0.585		0.174	1.194	9.97
Area to be removed (ha)				0.585		0.174	1.194	9.97
Estimated Gain Target (x4 ha)				2.34		0.696	4.776	39.88

* The minimum strategic biodiversity score is 80 per cent of the weighted average score across habitat zones where a general offset is required.

2.2. State Offset targets under the Guidelines

The vegetation removal comprises the removal of 17.679 ha of *Heavier soils* Plains Grassland (EVC 132_61).

NVIM calculated total offset requirements for this vegetation removal as 3.808 General BEUs. No specific offsets regarding threatened species are required under the state offset regulations.

General offsets must meet the minimum Strategic biodiversity score of 0.580, 80 per cent of the weighted average score across habitat zones with a general offset.

Table 3: Summary of State offset targets

Offset Type	Catchment	Removal BEUS	Multiplier	Target Protect BEUS	Minimum SBS
General	Corangamite	3.803	1.5	5.704	0.580

All gain targets (Table 3) will be met by the proposed offset on implementation of this plan.

2.3. Commonwealth EPBC Act Offset Requirements

The following eight principles for the use of environmental offsets under the EPBC Act are specified in the EPBC Environmental Offsets Policy (DSEWPoC, 2012):

1. The offset should be targeted to the matter protected by the EPBC Act being impacted on.
2. A flexible approach should be taken to the design and use of environmental offsets to achieve long-term and certain conservation outcomes which are cost effective for proponents.
3. Environmental offsets should deliver a real conservation outcome.
4. Environmental offsets should be developed as a package of actions - which may include both direct and indirect offsets.
5. Environmental offsets should, as a minimum, be commensurate with the magnitude of the impacts of the development and ideally deliver outcomes that are 'like for like'.
6. Environmental offsets should be located within the same general area as the development activity.
7. Environmental offsets should be delivered in a timely manner and be long lasting.
8. Environmental offsets should be enforceable, monitored and audited.

The offsets outlined in this plan will meet the requirements under the EPBC Act to compensate for the removal of 9.97 ha Natural Temperate Grassland of the Victorian Volcanic Plains.

2.4. Description of offset property

The 30 ha offset site proposed for this plan (Figure 1) is located on an approximately 195 hectare property of private land located 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. It is currently zoned Farming Zone (FZ) in the Golden Plains planning scheme. No overlays relevant to this investigation cover the study area.

2.4.1. Site eligibility

For a site to be eligible as an offset, it must meet all of the requirements outlined below.

Offsets must be sited at least 150 metres away from any dwellings and associated buildings on the subject land or adjoining properties covered by a BMO, or at least 50 metres away from these structures on all other land occurring within Bushfire Prone Areas. They must also be set back at least six metres from property boundaries to allow for firebreaks, boundary fence maintenance, etc.

Offsets may not be located in areas subject to the following encumbrances or constraints, which impede the ability to achieve native vegetation management/revegetation objectives:

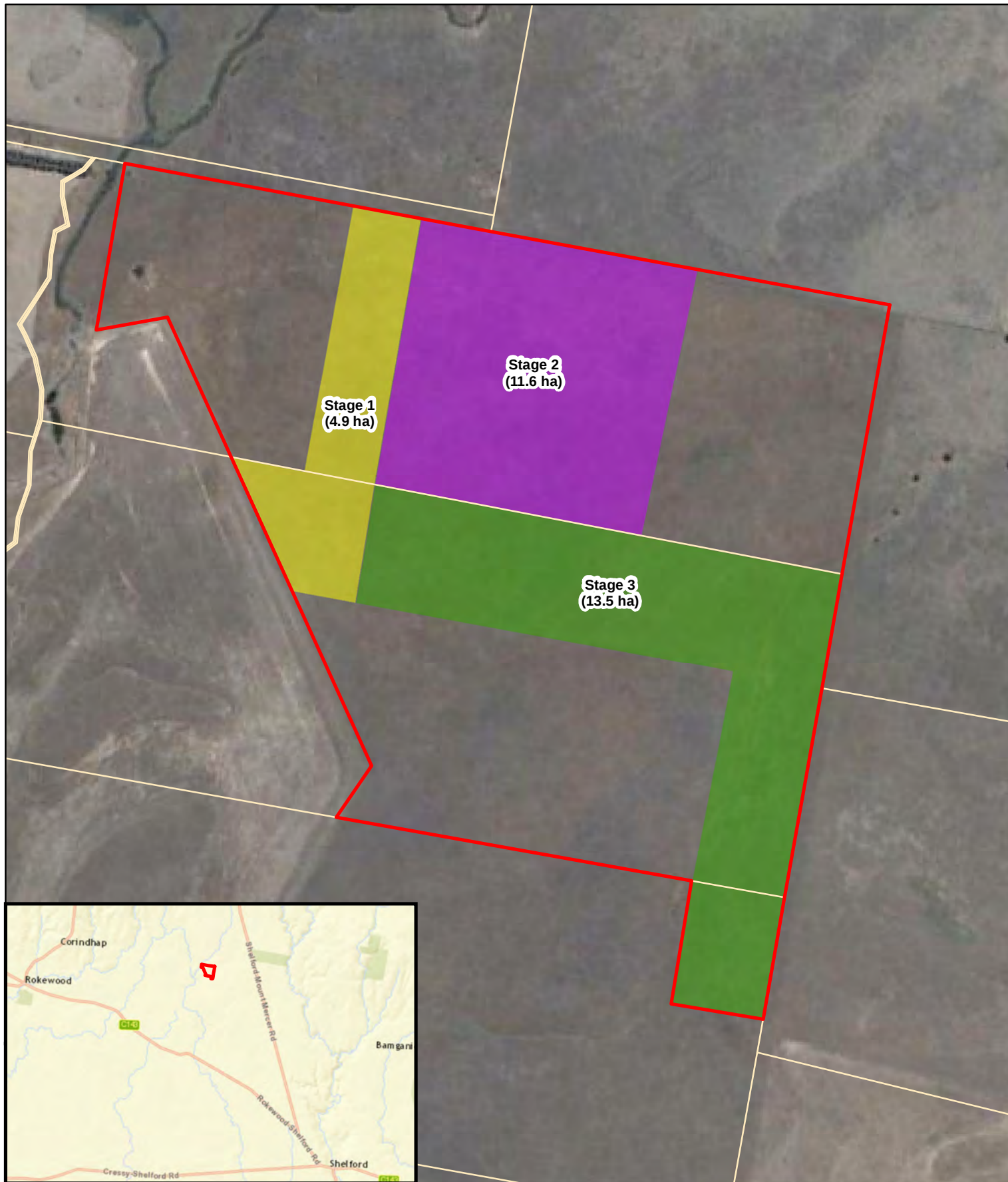
- Incompatible current and/or future land use (where known);
- Existing offsets or other existing agreements; or
- Identified threats to native vegetation condition.

Revegetation offsets must be at least one hectare in size; have an average width of at least 20 metres; and have a perimeter to area ratio of 1:20.

An assessment of the study area against these site eligibility criteria is provided in Table 4. The study area met all eligibility criteria.

Table 4: Assessment of the study area against site eligibility criteria

Criteria			Eligible?	Notes
Land Classifications				
BMO?	Yes	Offset is >150m from dwelling	N/A	
	No	Offset is >50m from dwelling	Yes	
Current/future Land use				
NO Infrastructure easements within offset area			Yes	
NO other uses that are incompatible with managing native vegetation for conservation, including those with a public acquisition overlay (PAO) for creation of a road or with approval to undertake activities that will damage native vegetation (e.g. extractive industries works approvals)			Yes	
Reveg ONLY - Size Conditions				
Site is at least 1 hectare in size			N/A	
Site has average width of at least 20 metres			N/A	
Site has perimeter to area ratio of 1:20. (Perimeter to area ratio can be calculated by dividing the area (metres ²) by the perimeter (metres)).			N/A	
Land Classifications				
NO existing Offset or other current agreement under an incentive or grant program to undertake management actions?			Yes	Offsets in adjacent areas, but the study area is available for offsets
Threats to native vegetation				
NO planned disturbance regimes incompatible with native vegetation objectives –e.g. fuel reduction burning, flooding.			Yes	
Current/future Land use				
No fuel reduction activities requiring removal of logs or trimming/clearing of understorey plants or trees			Yes	
No horse-riding, cycling or motorised vehicle use off established tracks			Yes	
No Other ongoing land uses that are likely to degrade/restrict improvement in vegetation condition			Yes	
Threats to native vegetation condition Or can management for gain control the threat?				
No high levels of nutrient run off			Yes	
No secondary salinity – likely to increase			Yes	
No continuing significant erosion which is uncontrollable without affecting native vegetation			Yes	
No significant pest animal infestation - rabbits, deer, goats and pigs etc			Yes	
No extensive die-back / plant diseases			Yes	



Legend

- Study area
- Cadastre

Offset sites

- Stage 1
- Stage 2
- Stage 3

0 100 200 400 Metres

Figure 1: Offset Site

Project: Warrambeen Offset Site

Client: Manzeene Avenue Development Project Trust

Project No.: 13029

Date: 9/12/2015

Created By: M. Ghasemi / I. Kulik

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2.4.2. Flora

Vegetation

The Offset Site is part of a single continuous patch of *Heavier-soils* Plains Grassland (EVC 132_61). In total it consists of 30 hectares of a larger paddock.

During the field assessment for this offset management plan the grassland offset site was identified as meeting the following attributes:

- Darkly coloured, cracking basalt soils;
- Exposed basalt rocks; and
- Greater than 500mm annual rainfall.

Observed vegetation comprised a high cover and high species richness of indigenous herbs and grasses. Native grasses included Kangaroo grass, Common Wheat-grass and Wallaby Grass, Spear Grass and Tussock Grass species. Non-grass weeds comprised less than 30% of the vegetation cover, which classifies this grassland as NTGVVP. The cover of indigenous herbs was widely spread through the site; Blue Devil, Pink Bindweed and Small Scurf Pea were the most abundant.

One flora species listed under the FFG Act and DELWP advisory list was recorded at the offset site: Small Milkwort. Given the high quality of the vegetation, it is likely that more threatened flora species would occur within the area.

Weed cover within the offsite was considered moderate (25-35%), dominated by Bearded Oat. High threat weeds such as Spear Thistle, Saffron Thistle, Towoomba Canary Grass and Horehound were present, as well as scattered occurrences of the woody weed Sweet Briar-rose. A small infestation of Serrated Tussock was observed, a high threat weed that is widespread in the western farming areas of Victoria.

The NTGVVP community at the site is of high conservation value. The site exceeds the minimum condition thresholds and shows the following features:

- High native plant species richness;
- Large patch size;
- Moderate weed invasion;
- Presence of threatened species;
- Natural exposed rock outcrops; and
- Mosses, lichens, soil crusts.

The survey was undertaken in 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. Due to this, the biodiversity value of the grassland patch may be underestimated.

Ecological Vegetation Class

Pre-European EVC mapping (DELWP 2015) indicated that the study area and surrounds would have supported Plains Grassland (EVC 132) and Plains Grassy

Woodland (EVC 55_61) prior to European settlement based on modelling of factors including rainfall, aspect, soils and remaining vegetation.

Evidence on site, including floristic composition, soil characteristics and average annual rainfall, suggested that *Heavier-soils Plains Grassland* (EVC 132_61), was present across the entire study area.

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

Three remnant patches (referred to herein as offset zones A, B and C (see Figure 1) comprising the abovementioned EVC are pertinent to this offset plan (Table 5). These patches formed part of a larger, continuous area of high-quality native grassland, with a gradient of decreasing weed cover and increasing species richness from west to east that reflects distance from roads, cropped land and non-native vegetation. The offset site has been divided into three offset zones to reflect the staged nature of the offset procurement.

Table 5: Description of offset zones pertinent to this offset plan

Offset Zone	Bio-region	EVC	Description
A (4.5 ha)	VVP	<i>Heavier-soils Plains Grassland</i> (EVC 132_61) NTGVVP	A large continuous patch of high quality native grassland that was dominated by a number of indigenous grasses and herbs. Tussock grasses, Common Wheat-grass, Kangaroo grass and Spear grass species were co-dominant across the area, with native herbs such as Blue Devils, Pink Bindweed and Small Scurf-pea common and widespread throughout the site. Recruitment area was moderately high, with high litter presence dominated by native organic litter. The area was gently undulating, with a number of basalt rocky rises. Introduced species were present with moderate (35%) cover dominated by Bearded Oat with some high threat species.
B (11.6 ha)	VVP	<i>Heavier-soils Plains Grassland</i> (EVC 132_61) NTGVVP	A large continuous patch of high quality native grassland that was dominated by a number of indigenous grasses and herbs. Tussock grasses, Common Wheat-grass, Kangaroo grass and Spear grass species were co-dominant across the area, with native herbs such as Blue Devils, Pink Bindweed and Grassland Wood-sorrel common and widespread throughout the site. Recruitment area was moderate, with high litter presence dominated by native organic litter. The area was gently undulating, with a number of basalt rocky rises. Introduced species were present with moderately low (25%) cover dominated by Bearded Oat with some high threat species.

Offset Zone	Bio-region	EVC	Description
C (13.5 ha)	VVP	Heavier-soils Plains Grassland (EVC 132_61) NTGWVP	A large continuous patch of very high quality native grassland that was dominated by a number of indigenous grasses and herbs. Tussock grasses, Common Wheat-grass, Kangaroo grass and Spear grass species were co-dominant across the area, with a high diversity of native herbs such as Blue Devils, Pink Bindweed and Grassland Wood-sorrel common and widespread throughout the entire site. The FFG Act and DELWP listed species Small Milkwort was recorded within this zone. Recruitment area was moderate, with moderate litter presence dominated by native organic litter. The area was gently undulating, with a number of basalt rocky rises and an ephemeral creekline that was dry at the time of survey. Introduced species were present with moderate (30%) cover dominated by Bearded Oat with some high threat species.

Under this plan, the offset zones will be utilised to provide offsets for the subject clearing.

Flora species

Flora species recorded

The offset site was found to support 57 species of plants, 34 (60%) of which were indigenous and 23 (40%) of which were introduced in origin. These are listed in Appendix 1.

Threatened flora species

VBA records (VBA 2015) and the EPBC Protected Matters Search Tool (Department of the Environment 2015) indicated that within the search region there were records of, or there occurred potential suitable habitat for, 12 species listed under the Commonwealth EPBC Act and 18 listed under the state *Flora and Fauna Guarantee Act 1988* (FFG Act), including 11 listed under both Acts. No flora species listed under the EPBC Act were recorded during the field survey.

Note that the *search region* defined for the offset site was an area with radius 10 kilometres from the approximate centre point of the offset site of coordinates: latitude 37° 53' 4.42" S and longitude 143° 51' 36.71" E.

The likelihood of occurrence in the study area of species listed under the EPBC Act is addressed in Table 6. 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 the following listed flora species are likely to occur or have the potential to occur:

- Adamson's Blown-grass (Endangered – EPBC Act);
- Clover Glycine (Vulnerable – EPBC Act); and
- Spiny Rice-flower (Critically Endangered – EPBC Act).

One species listed under the FFG Act (Small Milkwort) was recorded during the field survey.

Table 6: FFG Act and EPBC Act listed flora species and likelihood of occurrence

Common name	Scientific Name	EPBC Status	Habitat	Number of records	Date of last record	Likelihood of occurrence
Adamson's Blown-grass	<i>Lachnagrostis adamsonii</i>	E	Adamson's Blown-grass is mainly found on roadside depressions and flats, associated with drainage lines and small sluggish creeks, particularly where these sites are protected from wind by surrounding rises or by stands of tall grasses such as Canary Grass, or sedge and rush species (DSE 2000). Associated species include Streaked Arrowgrass, Plains Saltmarsh-grass, Australian Salt-grass, Common Blown-grass and Beaded Glasswort (Murphy 2010).	4	27/05/2002	Limited suitable habitat along ephemeral creek in offset zone C. Potential to occur.
Button Wrinklewort	<i>Rutidosia leptorhynchoides</i>	E	Basaltic grasslands between Rokewood and Melbourne (Jeanes 1999).	No records	N/A	Suitable habitat present. Considered unlikely to occur as known populations are >10km away.
Clover Glycine	<i>Glycine latrobeana</i>	V	In Victoria, occurs mainly in grasslands and grassy woodlands on basalt soils dominated by Kangaroo Grass; within intermittently flooded streamlines co-dominated by Yellow Gum and Scentbark over mixed grasses and shrubs (Grampians/Black Range); herb-rich woodland (Reef Hills State Park); Valley Grassy Forest dominated by Yellow Box with scattered Hedge Wattle (Yarra Valley Parklands and Meruka Park). Other former sites are Grassy Dry Forest with Red Box. (Carter & Sutter 2010; D.Coppolino pers. Obs.). It is also found rarely in heathland (Carter & Sutter 2010).	6	16/12/2004	Suitable habitat present. Considered likely to occur.

Common name	Scientific Name	EPBC Status	Habitat	Number of records	Date of last record	Likelihood of occurrence
Hoary Sunray	<i>Leucochrysum albicans</i> var. <i>tricolor</i>	E	Western Victoria in dry, open situations (Marriott & Marriott 1998; Lunt et. al. 1998).	No records	N/A	Suitable habitat present. Considered unlikely to occur as known populations are >10km away.
Large-headed Fireweed	<i>Senecio macrocarpus</i>	V	Occurs in a variety of habitats, including grasslands, sedgeland, shrublands and woodlands, generally on sparsely vegetated sites on sandy loam to heavy clay soils, often in depressions that are waterlogged in winter (Sinclair 2010).	No records	N/A	Limited suitable habitat present. Considered unlikely to occur - known populations are >10km away.
Maroon Leek-orchid	<i>Prasophyllum frenchii</i>	E	Favouring heathland and Grassland on black clays (Bates 1994).	3	13/11/1992	No suitable habitat. Considered unlikely to occur.
Matted Flax-lily	<i>Dianella amoena</i>	E	Lowland grassland and grassy woodlands on well-drained to seasonally waterlogged fertile sandy loams to heavy cracking soils derived from sedimentary or volcanic Geology. It is widely distributed from eastern to south-western Victoria (Carter 2010).	1	25/01/2012	Limited suitable habitat present, however only one record within 10 km. Potential to occur.

Common name	Scientific Name	EPBC Status	Habitat	Number of records	Date of last record	Likelihood of occurrence
Metallic Sun-orchid	<i>Thelymitra epipactoides</i>	E	Primarily in mesic coastal heathlands, grasslands and woodlands, but also in drier inland heathlands, open forests and woodlands. (Backhouse & Jeanes 1995 in DSEWPC 2003).	No records	N/A	Suitable habitat present. Considered unlikely to occur as known populations are >10km away.
Spiny Rice-flower	<i>Pimelea spinescens subsp. spinescens</i>	C	Grasslands or open shrublands on basalt derived soils (Entwisle 1996). Prefers shallow depressions and drainage lines with moderate soil moisture (D.Coppolino pers. obs.).	27	3/08/2011	Suitable habitat present. Recorded elsewhere on property and considered likely to occur.
Spiral Sun-orchid	<i>Thelymitra matthewsii</i>	V	Slightly elevated sites to 300m in well-drained soils (sandy loams to gravelly limestone soils) in light to dense forest; sometimes in coastal sandy flats (Weber & Entwisle 1994).	No records	N/A	No suitable habitat. Considered unlikely to occur.
Swamp Everlasting	<i>Xerochrysum palustre</i>	V	Sedge-rich swamps and wetlands, usually on black cracking clay soils (Walsh and Entwisle 1999). Scattered occurrences in Victoria range from the South Australian border in the west to the Cobberas, near Benambra, in the East (DSE 2008).	No records	N/A	No suitable habitat. Considered unlikely to occur.

Common name	Scientific Name	EPBC Status	Habitat	Number of records	Date of last record	Likelihood of occurrence
Swamp Fireweed	<i>Senecio psilocarpus</i>	V	Herb-rich winter-wet swamps on volcanic clays or peaty soils (Walsh 1999). Known from approximately 10 sites between Wallan, about 45 km north of Melbourne, and Honans Scrub in south-eastern South Australia (DSEWPC 2008).	No records	N/A	No suitable habitat. Considered unlikely to occur.

EPBC = EPBC Act; **C** = critically endangered; **E** = endangered; **V** = vulnerable.

2.4.3. Fauna

To the best of our knowledge, a fauna assessment of the offset site has not been carried out. Consequently, the influence of threatened species on conservation significance within the offset site was based solely on flora species. Due to very high conservation significance native vegetation already being attained within the offset site, the presence or absence of fauna species will not alter the habitat hectare results. The site is likely to be high quality Golden Sun Moth and Striped Legless Lizard habitat however detailed surveying has not been carried out.

2.4.4. Management issues (threats)

Current management issues within the offset site are listed below. These threats must be controlled to maximise offset gains. The following threats are considered to be ‘high threats’ in the offset site.

Weeds

Weed species including Spear Thistle, Saffron Thistle, Squirrel-tail Fescue, Bearded Oat and Toowoomba Canary-grass contribute approximately 25-35 % vegetative cover in the offset site. Under the current offset plan, 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.

Pest Animals

During previous field assessments undertaken within the property (BL&A 2015), rabbits and foxes were observed. Under this proposed offset plan, these threats are required to be controlled. This control regime may include introducing pest-proof fencing around the perimeter of the paddock.

Site Management

The offset site is part of a larger paddock, which contains grassland of similar quality, with the same threats to management. The adjacent areas are currently managed as offsets for other projects, and as such will be managed as one grassland community, rather than in individual “offset zones”. Management will commence at different times across this paddock as offsets are allocated. The implication of this for management is that there will be no fence around the majority of the perimeter of the offset zone, however fencing in a state of good repair exists around the larger paddock.

2.5. Quantification of gains available on offset site

The following table quantifies the offset gains available at the offset site and the specific landowner commitments by which those gains were generated in accordance with the prescriptions in DELWP's vegetation gain approach manual (DEPI 2013b).

Table 7: Quantification of offset gains available: protection and management of a remnant patch

Management Zone			A			B			C		
EVC No.			132_61			132_61			132_61		
Area (ha) to be set aside for offsets (see Figure 1)			4.9			11.6			13.5		
Current Score (out of 100) ¹			57			61			73		
Treeless EVC standardiser ²			1.36			1.36			1.36		
Site Condition			Current Score	Maintenance	Improvement	Current Score	Maintenance	Improvement	Current Score	Maintenance	Improvement
	Large Old Trees	/15	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Canopy Cover	/5	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lack of Weeds	/15	6	NA	1	9	NA	2	6	NA	1
	Understorey	/25	15	7.5	1.25	15	7.5	2.5	25	12.5	0
	Recruitment	/10	6	3	1	6	3	2	6	3	1
	Organic Matter	/5	3	1.5	1	3	1.5	1	5	2.5	0
	Logs	/5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Subtotal of gains achievable in zone				12	4.25		12	7.5		18	2
Total maintenance and improvement gains (/100) ³			22.10			26.52			27.20		
Prior management gain (/100) ⁴			5.70			6.10			7.30		
Security gain (/100) ⁵			5.70			6.10			7.30		
Total Hha gain per ha of zone (/1) ⁶			0.335			0.387			0.418		
Net Gain (habitat hectares) ⁷			1.642			4.492			5.643		

Notes:

1. The habitat score of the offset zone as a whole number between 1 and 100.
2. Site Condition gains standardizing multiplier, as per Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004).
3. Total gain points available from maintenance and improvement commitments, then multiplied by the Site Condition gains standardizing multiplier (out of 100).
4. Only available on freehold land - calculated as 10% of the current habitat score for the offset zone (out of 100).
5. Only available if the site is to be made legally more secure, such as by an on-title conservation agreement or reservation etc. Gain varies according to a number of improved security options, as per Table 1a of DELWP's vegetation gain approach manual (DEPI 2013b). (Gain out of 100).

6. Total gain points available from the four possible sources (maintenance, improvement, prior management and security) as a rate of gain in Habitat Hectares per hectare (HHA/ha) to 3 decimal places.
7. The total gain available from each offset zone = the rate of gain per hectare (6) multiplied by the area of the offset zone in hectares to three decimal places.

2.6. Meeting Commonwealth offset requirements

The eight offset principles outlined in the Commonwealth Draft Offsets Policy (see Section 2.2.1) are met with the proposed offset scenario as detailed in Table 8.

Table 8: Meeting Commonwealth offset requirements

Commonwealth Requirement	Proposed Offset Site (Warrambeen)
Environmental offsets should be targeted to the matter protected by the EPBC Act that is being impacted	The offset site contains NTGVVP
A flexible approach should be taken to the design and use of environmental offsets to achieve long-term and certain conservation outcomes which are cost effective for proponents.	This management plan allows a flexible approach as it is consistent with the principles of adaptive management. By monitoring the outcomes of actions, management may be adapted to ensure the stated commitments in the Plan are being met. For example, new techniques for controlling high threat weeds may become available, or further information on the ecology and status of the vegetation communities or animal species concerned may require an adjustment to management actions.
Environmental offsets should deliver a real conservation outcome.	The real conservation outcome would be the protection and enhancement of existing Plains Grassland (NTGVVP) of high conservation value. The site exceeds the minimum condition thresholds and shows the following features: ▪ High native plant species richness ▪ Large patch size ▪ Moderate weed invasion ▪ Presence of threatened species ▪ Natural exposed rock outcrops ▪ Mosses, lichens, soil crusts
Environmental offsets should be developed as a package of actions - which may include both direct and indirect offsets.	EPBC Offsets are packaged together with State Offsets in this 10 year OMP in one contiguous site, which will be managed within a larger high-quality grassland area. No indirect offsets are proposed.
Environmental offsets should, as a minimum, be commensurate with the magnitude of the impacts of the development and ideally deliver outcomes that are 'like for like'.	A 30 ha section of a larger property of NTGVVP will ensure a like-for-like offset within the magnitude of the impacts.
Environmental offsets should be located within the same general area as the development activity.	The offset site is located within the same bioregion as the proposed development (Victorian Volcanic Plains), and the same Catchment (Corangamite). Past offsets for impacts on MNES in Melbourne's west have been undertaken in this general area.
Environmental offsets should be delivered in a timely manner and be long lasting.	This is achieved by securing the site through a section 173 agreement and managing the site through the landowner.
Environmental offsets should be enforceable, monitored and audited.	This is achieved by securing and managing the site, consistent with any EPBC Act and planning permit conditions.

The above table shows that, subject to approval and implementation of management practices, all eight of the Commonwealth policy targets can be met by these proposed offset sites.

2.7. Meeting state offset gain targets

The required offset gains are allocated to Offset Zones A-Y as detailed in Table 9.

Table 9: Allocation of native vegetation gains for clearing a remnant patch

Offset Target			Source of gains to meet the target			Outcome
Habitat Zones	Target BEUs	Min SBS	Offset Zones	BEUs Gain	SBS of Offset	Surplus (BEU)
HZ A-Y	5.704 General	0.580	OZ A-C	5.878 General	TBC	TBC

BL&A are currently waiting for an updated BIOR report detailing the available general BEUs per stage. This section will be completed once the BIOR report is available.

The outcome of the offset scenario employed in this plan results in a surplus of XX (TBC) general biodiversity equivalence units. The remainder of the BEUs are not available for other offsets under the state Guidelines, as it is likely all of the area will be allocated as offsets for the removal of NTGVVP under the Federal EPBC Act.

The State offset gain surplus will provide a buffer between prescribed gains and realized gains.

3. OFFSET IMPLEMENTATION (PART B)

Table 10: Offset site details

Landowner of offset site	Warrambeen Pty Ltd.
Type of offset (onsite, 3 rd party)	3 rd party
Location and address of offset site	Warrambeen Estate, Shelford
Area of offset site (ha)	30 ha
Offset site number (if applicable)	
Volume	
Folio	
Parish	Parish of Shelford West and Wurrock
Allotment	
Local Government Area	Golden Plains
Responsible Authority	Golden Plains Shire
Bioregion	Victorian Volcanic Plain

3.1. Strategy for offset site

The offset site is to be secured and managed for the purposes of conservation in perpetuity.

The type of security will be a Section 173 agreement on the title. The proposed development at Manzeene Avenue, Lara will occur in approximately three stages over five to six years starting in 2016. The removal of NTGVVP will hence occur gradually in several stages. A pre-agreement is proposed between the proponent and the landowner of the offset site to secure the whole offset site for this development, but the Section 173 agreement will be extended gradually to include the required offset at each stage.

Table 11: Offset security and management responsibility

Who is liable/responsible for meeting offset requirements?	Manzeene Avenue Development Project Trust Pty Ltd
Type of security i.e. Planning Permit Condition, Section 69 of the <i>Conservation, Forest and Lands Act 1987 (Vic)</i> , Section 173 of the <i>Planning and Environment Act 1987 (Vic)</i> Covenant under the <i>Victorian Conservation Trust Act 1972 (Vic)</i>	Section 173 agreement
Agreement or Planning Permit Number (ID)	464/2014
Date 10-year offset management to commence	<i>To be advised</i>
Date 10-year offset management expires	<i>10 years from commencement date</i>
Registered on title? (Yes/No)	yes
Offset site management responsibility (i.e. Landowner, Authority Name)	Warrambeen Gumley Land Trust
Offset Monitoring Responsibility (i.e. Responsible Authority, DELWP)	Corangamite Shire, Department of the Environment (Canberra)

3.2. Ongoing land-use commitments

In accordance with the prescriptions in DELWP's vegetation gain approach manual (DEPI 2013b), the landowner must forego the following entitlements in perpetuity to achieve the maintenance and improvement gain components of the offsets:

- Retaining all native vegetation, dead or alive;
- Maintain the improvement gain achieved at completion of this offset plan such that:
 - Weed cover does not increase beyond the level attained at the completion of Year 10; and
 - Pest animals are controlled to the level attained at the completion of Year 10.

Any proposed uses or development of the site which conflict with the landowner commitments are not allowed under this plan.

3.3. Management actions

3.3.1. Management actions to be undertaken

In accordance with the prescriptions in DELWP's vegetation gain approach manual (DEPI 2013b), the landowner must commit to the following management actions for the 10 year life of this plan to achieve the improvement gain components of the offsets:

- Ensuring that weed cover does not increase beyond the level it was prior to inception of the offset plan;
- Monitoring any new and emerging weeds and eliminating to cover <1%;
- Eliminating all woody environmental weeds to <1% cover in Offset Zone A and Offset Zone C;
- Eliminating all GS target weeds (identified in Appendix 1) in Offset Zone B;
- Controlling Rabbits;
- Maintenance of fences; and
- Implementing a periodic biomass management strategy at an agreed timing and frequency - to be negotiated with DELWP.

Weed control

Cover of all weed species which occur on site and their control methods are shown in Table 12.

Cover of all weeds must be controlled such that it does not increase beyond the current level.

One woody environmental weed was present within the offset zones. This is Sweet Briar-rose. This species should be controlled to <1% cover within Offset Zone A and Offset Zone C.

Weed species listed in DELWP's vegetation gain approach manual (DEPI 2013b) as Gain Scoring target weeds are identified in Appendix 1. These should be controlled to <1% cover within Offset Zone B.

Every weed control action must be undertaken by a bushland contractor with experience in weed management within the Golden Plains Shire.

Please note that land managers are expected to meet their obligations 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 (identified in Appendix 1). Land manager commitments to reduce the cover of regionally controlled weeds to negligible levels (<1 % cover) and control of non-listed environmental weeds can result in an improvement gain.

Pest Animal Control

Rabbit numbers on the offset site are currently limited. Notwithstanding this, regular monitoring and 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.

Fencing

The current fencing around the larger paddock is of good quality and must be maintained over the years to retain this standard. Fencing will ensure that disturbance to grassland and fauna, such as the Golden Sun Moth, by unauthorised human access or threatening herbivores is prevented. A fence currently surrounds the larger paddock and no additional fence between different offset parties is required.

Biomass Control

Biomass control must ensure that the vegetation at the site continues to provide high quality habitat for the NTGVVP community. Biomass control requirements need to be monitored on a seasonal basis. The goal for biomass control is to maintain high quality NTGVVP grassland community.

The control of biomass can be implemented at the site through ecological burning and stock grazing (e.g. sheep) following these guidelines:

- Mosaic or patch burning is recommended to retain animal refuges;
- Burning can occur every 2-5 years between late summer to early autumn avoiding the reproductive cycle of most plants and animals;
- Avoid grazing between early spring and mid-summer, if appropriate, when most native plants are growing, flowering or setting seed;
- Avoid grazing in wet condition, if appropriate, when the soil crust and indigenous plants are vulnerable to damage from trampling by hard-hoofed stock.

Table 12: Weed species and control methods

Gain scoring target weeds (DEPI 2013b) are shaded in grey

Common Name	Scientific name	Weed Category	Control requirement		Current % Cover	Control method	Optimal timing
			Control under CaLP Act	Control under offset plan - Ensure cover does not increase beyond current level			
Bearded Oat	<i>Avena barbata</i>	Other weed		X	15%	Spot-spray using a non-selective or grass-selective herbicide.	Winter to spring (before seed-set)
Cape weed	<i>Arctotheca calendula</i>	Other weed		X	<1%	Spot spray prior to flowering. Annual lifecycle - heavy control in early outbreak can reduce spread quickly.	Spring
Common Heron's-bill	<i>Erodium cicutarium</i>	Other weed		X	<1%	Spot-spray during growth period as well as during the flowering. Manage intensively for the first three years, aiming to prevent seed set during this period.	Early winter to mid spring (growth); late winter to mid spring (flowers).
Common Sow-thistle	<i>Sonchus oleraceus</i>	Other weed		X	<1%	Spot-spray using an appropriate herbicide and wetting agent.	Autumn to Spring
Cat's Ear	<i>Hypochoeris radicata</i>	Other weed		X	1-5%	Spot-spray using a non-selective herbicide.	Autumn and spring
Hair Grass	<i>Aira</i> spp.	Other weed		X	<1%	Spot-spray using a non-selective or grass-selective herbicide.	Winter to spring (before seed-set)
Horehound	<i>Marrubium vulgare</i>	High-threat non-woody weed	X	X	<1%	Chip out or burn mature plants; spot-spray seedlings with an appropriate herbicide.	Spring (before flowers mature)
Large Quaking-grass	<i>Briza maxima</i>	Other Weed		X	<1%	Hand pull or spot sprat with grass-selective herbicide/Pulse	Autumn

Common Name	Scientific name	Weed Category	Control requirement		Current % Cover	Control method	Optimal timing
			Control under CaLP Act	Control under offset plan - Ensure cover does not increase beyond current level			
						graze/burn during flowering but prior to seeding (late winter to early spring).	
Narrow-leaf Clover	<i>Trifolium angustifolium</i> var. <i>angustifolium</i>	Other weed		X	<1%	Hand remove small/isolated infestations. Otherwise spot spray with 1% glyphosate before flowering.	Winter and spring
Ox-tongue	<i>Helminthotheca echioides</i>	Other weed		X	<1%	Spot-spray using a non-selective herbicide.	Autumn and spring
Saffron Thistle	<i>Carthamus lanatus</i>	High-threat non-woody weed		X	1%	Remove any flower heads before they go to seed. Spot-spray leaves using an appropriate herbicide.	Late summer and early autumn
Serrated Tussock	<i>Nassella trichotoma</i>	High-threat non-woody weed	X	X	<1%	Spot-spray using an appropriate herbicide.	Autumn and spring
Slender Thistle	<i>Carduus pycnocephalus</i>	High-threat non-woody weed		X	<1%	Remove any flower heads before they go to seed. Spot-spray leaves using an appropriate herbicide.	Summer and autumn
Soft Brome	<i>Bromus hordeaceus</i> subsp. <i>hordeaceus</i>	Other Weed		X	<1%	Spot-spray using a non-selective or grass-selective herbicide.	Autumn and spring

Common Name	Scientific name	Weed Category	Control requirement		Current % Cover	Control method	Optimal timing
			Control under CaLP Act	Control under offset plan - Ensure cover does not increase beyond current level			
Spear Thistle	<i>Cirsium vulgare</i>	High-threat non-woody weed		X	1-5%	Remove any flower heads before they go to seed. Spot-spray leaves using an appropriate herbicide.	Autumn and spring
Squirrel-tail Fescue	<i>Vulpia bromoides</i>	Other weed		X	1-5%	Hand weed/spot burn/pulse graze before seed set	Early spring (before seeds develop)
Sweet Briar	<i>Rosa rubiginosa</i>	High-threat woody weed	X	X	<1%	Cut and swab mature plants using an appropriate herbicide. Spot-spray seedlings with appropriate herbicide.	Autumn and spring
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	High-threat non-woody weed		X	1%	Spot-spray using a non-selective or grass-selective herbicide.	Winter to spring (before seeds ripen).
Toowoomba Canary-grass	<i>Phalaris aquatica</i>	High-threat non-woody weed		X	<1%	Spot-spray using an appropriate herbicide.	Autumn and spring
Wild Sage	<i>Salvia verbenaca</i>	High-threat non-woody weed		X	<1%	Remove any flower heads before they go to seed. Spot-spray leaves using an appropriate herbicide.	Autumn and spring
Wimmera Rye-grass	<i>Lolium rigidum</i>	High-threat non-woody weed		X	1-5%	Burn using a hand-held gas burner / Slash to ground level using a brush-cutter / pulse graze.	Early spring (before seeds develop)
Yorkshire Fog	<i>Holcus lanatus</i>	High-threat non-woody weed		X	1%	Spot-spray using a non-selective or grass-selective herbicide.	Autumn and spring

3.3.2. Management action tables

The following tables identify specific management actions and targets pertaining to the management of the proposed offset.

Table 13: Year 1 actions

Management Action	Timing	Target to be achieved	Responsible person	Completed (Yes/No)	Month and Year Completed
Estimate the following conditions: - Overall weed cover; - cover of each weed species; - cover of each high threat woody weed species Refer to Table 12 for cover of weed species	Commencement of plan	- Overall weed cover benchmark* documented; <i>High threat</i> woody weed cover benchmark* documented; - Cover of each weed species listed in Table 12 documented; - Cover of each <i>high threat</i> woody weed species listed in Table 12 documented.	Warrambeen Gumley Land Trust		
Check fencing around paddock.	Commencement of plan	Fencing must prevent entry of threatening herbivores.	Warrambeen Gumley Land Trust		
Rabbit Control to be carried out if required – Fumigate and collapse burrows where present.	Late Summer/Autumn	<5% survival of target; <2% death of non target species.	Warrambeen Gumley Land Trust		
Weed control: - Treat <i>high threat</i> woody weeds as per Table 12; - Treat other weeds species if required.	Spring	- Cover of each <i>high threat</i> woody weed species reduced to <1%; - Cover of each weed species maintained at current level <i>High threat</i> weed cover benchmark* not exceeded; - Overall weed cover benchmark* not exceeded.	Warrambeen Gumley Land Trust		

Management Action	Timing	Target to be achieved	Responsible person	Completed (Yes/No)	Month and Year Completed
Monitoring: - Estimate overall weed cover and cover of each <i>high threat</i> [woody] weed species (refer to Table 12); - Establish photo points - Assess integrity of offset zone fencing; - Assess level of grazing pressure: - Monitor compliance with land-use commitments and other management commitments. - Monitor quality of NTGVVP	Spring	Monitoring results to be documented and retained for reporting purposes. Results should also inform management approaches and techniques.	Ecologist		
Weed control: - Treat <i>high threat</i> woody weeds as per Table 12; - Treat other weeds species if required.	Late spring	- Cover of each <i>high threat</i> woody weed species reduced to <1%; - Cover of each weed species maintained at current level <i>High threat</i> weed cover benchmark* not exceeded; - Overall weed cover benchmark* not exceeded..	Warrambeen Gumley Land Trust		
Report to be prepared documenting management actions undertaken and monitoring results. Report structure and content to be prescribed by DELWP and the Responsible Authority.	First year after start of management	Report delivered to the Responsible Authority and DoE no later than three months after the due date.	Warrambeen Gumley Land Trust / Ecologist		

* = The overall weed cover benchmark is an estimate of the overall weed cover at the commencement of the offset plan. This informs both contractors and auditors of the plan in ensuring that overall weed cover does not increase beyond that benchmark.

Table 14: Years 2-3 actions

Management Action	Timing	Target to be achieved	Responsible person	Completed (Yes/No)	Month and Year Completed
Rabbit Control to be carried out if required – Fumigate and collapse burrows where present or shooting	All years as required	<5% survival of target; <2% death of non target species.	Warrambeen Gumley Land Trust		
Weed control: - Treat <i>high threat</i> woody weeds as per Table 12; - Treat other weeds species if required.		- Cover of each <i>high threat</i> woody weed species reduced to <1%; - Cover of each weed species maintained at current level <i>High threat</i> weed cover benchmark* not exceeded; - Overall weed cover benchmark* not exceeded.	Warrambeen Gumley Land Trust		
Monitoring: - Estimate overall weed cover and cover of each <i>high threat</i> [woody] weed species (refer to Table 12); - Take pictures at photo points - Assess integrity of offset zone fencing; - Assess level of grazing pressure: - Monitor compliance with land-use commitments and other management commitments. - Monitor quality of NTGVVP	Spring	Monitoring results to be documented and retained for reporting purposes. Results should also inform management approaches and techniques.	Ecologist		
Year 2: Fence maintenance to be carried out if required	Following monitoring	Integrity of fencing maintained to exclude entry of threatening herbivores	Warrambeen Gumley Land Trust		

Management Action	Timing	Target to be achieved	Responsible person	Completed (Yes/No)	Month and Year Completed
Biomass Control: ▪ Sheep to be moved onto site in mid summer and removed before autumn rains, if appropriate ▪ Possibly subdivision of the site through electrical fencing to apply crash grazing for short periods and ensure no species are taken out selectively by sheep ▪ Small areas (< 4 ha) could be burned in consultation with the ecologist	Late Summer – Autumn/Early Winter	▪ No soil pitting cause by sheep. ▪ Vegetation cover to remain >10cm high with no more than 30% bare ground.	Warrambeen Gumley Land Trust		
Report to be prepared documenting management actions undertaken and monitoring results. Report structure and content to be prescribed by DoE and the Responsible Authority.	Second year after start of management	Report delivered to the Responsible Authority and DoE no later than three months after the due date.	Warrambeen Gumley Land Trust / Ecologist		

* = The overall weed cover benchmark is an estimate of the overall weed cover at the commencement of the offset plan. This informs both contractors and auditors of the plan in ensuring that overall weed cover does not increase beyond that benchmark.

Table 15: Years 4-10 actions

Management Action	Target to be achieved	Responsible person	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Rabbit Control to be carried out if required – Fumigate and collapse burrows where present or shooting	<5% survival of target; <2% death of non target species.	Warrambeen Gumley Land Trust		X		X		X	
Weed control: - Treat <i>high threat</i> woody weeds as per Table 12; - Treat other weeds species if required.	- Cover of each <i>high threat</i> woody weed species reduced to <1%; - Cover of each weed species maintained at year 1 level <i>High threat</i> weed cover benchmark* not exceeded; - Overall weed cover benchmark* not exceeded.	Warrambeen Gumley Land Trust	X	X	X	X	X	X	X
Monitoring: - Estimate overall weed cover and cover of each <i>high threat</i> woody weed species (refer to Table 12); - Take pictures at photo points; - Assess integrity of offset zone fencing; - Assess level of grazing pressure; - Monitor compliance with land-use commitments and other management commitments.	Monitoring results to be documented and retained for reporting purposes. Results should also inform management approaches and techniques.	Ecologist		X					X

Management Action	Target to be achieved	Responsible person	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Fence maintenance to be carried out if required	Integrity of fencing maintained to exclude entry of threatening herbivores	Warrambeen Gumley Land Trust	X		X		X		X
Biomass Control: - Sheep to be moved onto site in mid summer and removed before autumn rains - Possibly subdivision of the site through electrical fencing to apply crash grazing for short periods and ensure no species are taken out selectively by sheep - Small areas (< 4 ha) could be burned in consultation with the ecologist	- No soil pitting cause by sheep. - Vegetation cover to remain >10cm high with no more than 30% bare ground.	Warrambeen Gumley Land Trust	X	X	X	X	X	X	X
Report to be prepared documenting management actions undertaken and monitoring results. Report structure and content to be prescribed by DoE and the Responsible Authority.	Report delivered to the Responsible Authority and DoE no later than three months after the due date.	Warrambeen Gumley Land Trust/ Ecologist		X					X

* = The overall weed cover benchmark is an estimate of the overall weed cover at the commencement of the offset plan. This informs both contractors and auditors of the plan in ensuring that overall weed cover does not increase beyond that benchmark.

3.4. Monitoring and reporting

Monitoring of recruited and remnant native vegetation along with pest plants and animals will be undertaken on a regular basis for successful implementation of this plan and to inform future management.

The Landowner agrees to submit the Landowner Monitoring and Report Form to the DoE and the responsible authority as specified in Table 16.

Table 16: Landowner Monitoring and Reporting Schedule

Year	Year from commencement	Time of year	Monitoring Method	Person Responsible	Report due to DELWP by:
2016*	1	Spring	Landowner Monitoring Form	Warrambeen Gumley Land Trust	By 31 December 2016*
2017*	2				By 31 December 2017*
2020*	5	Any			By 31 December 2020*
2025*	10				By 31 December 2025*
Post 2025	As requested in writing by DoE and within a maximum 3 months of the date of issue				

*Note, these dates may change depending on the start date of the offset

3.5. Adaptive management

This plan provides actions for a period of 10 years. The timing of actions and whether they occur is based on adaptive management.

The management of the offset sites should be adapted if the condition of the *Natural Temperate Grassland of the Victorian Volcanic Plains* within the grassland offset zone declines (i.e. the coverage of native grasses drops below 80% of the existing coverage).

This management approach is consistent with the principles of adaptive management. By monitoring the outcomes of actions, management may be adapted to ensure the stated commitments in the Plan are being met. For example, new techniques for controlling high threat weeds may become available, or further information on the ecology and status of the vegetation communities or animal species concerned may require an adjustment to management actions.

Table 17 outlines adaptive management actions for threatened species and communities.

Table 17: Adaptive Management Actions

Trigger	Aim	Responsible person	Possible Corrective Actions*
NTGVVP: Coverage of native grasses drops below 80 % of original coverage	Adapt management to get coverage of native grasses up to 80% or more of original coverage	Warrambeen Gumley Trust	Weed Control as per Table 10 Recruitment Direct Seeding within areas formerly covered by weeds (sow Wallaby and Spear Grass seeds) Grazing Graze partial areas to reduce biomass

* The final corrective actions and their timing depend on the current condition of the site and management actions already undertaken and will need to be detailed based on the current situation and condition of the site.

4. REFERENCES

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Appendix 1: Flora species recorded in the offset site

Origin	Common Name	Scientific Name	EPBC	FFG	DELWP	CaLP Act	GS Target
	Sheep's Burr	<i>Acaena echinata</i>					
*	Hair Grass	<i>Aira spp.</i>					
	Common Wheat-grass	<i>Anthosachne scabra s.l.</i>					
*	Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>					B
*	Cape weed	<i>Arctotheca calendula</i>					
	Common Woodruff	<i>Asperula conferta</i>					
	Berry Saltbush	<i>Atriplex semibaccata</i>					
	Kneed Spear-grass	<i>Austrostipa bigeniculata</i>					
	Spurred Spear-grass	<i>Austrostipa gibbosa</i>					
*	Bearded Oat	<i>Avena barbata</i>					
*	Large Quaking-grass	<i>Briza maxima</i>					B
*	Soft Brome	<i>Bromus hordeaceus subsp. hordeaceus</i>					
	Lemon Beauty-heads	<i>Calocephalus citreus</i>					
*	Slender Thistle	<i>Carduus pycnocephalus</i>				R	
*	Saffron Thistle	<i>Carthamus lanatus</i>				R	
	Common Everlasting	<i>Chrysocephalum apiculatum</i>					
*	Spear Thistle	<i>Cirsium vulgare</i>				R	
	Small Milkwort	<i>Comesperma polygaloides</i>		L	v		
	Pink Bindweed	<i>Convolvulus erubescens s.l.</i>					
	Sweet Hound's-tongue	<i>Cynoglossum suaveolens</i>					
	Long-hair Plume-grass	<i>Dichelachne crinita</i>					
	Kidney-weed	<i>Dichondra repens</i>					
*	Common Heron's-bill	<i>Erodium cicutarium</i>					
	Blue Devil	<i>Eryngium ovinum</i>					
	Twining Glycine	<i>Glycine clandestina</i>					
	Variable Glycine	<i>Glycine tabacina s.l.</i>					
*	Ox-tongue	<i>Helminthotheca echioides</i>					
*	Yorkshire Fog	<i>Holcus lanatus</i>					B
*	Flatweed	<i>Hypochaeris radicata</i>					
	Gold Rush	<i>Juncus flavidus</i>					
	Common Blown-grass	<i>Lachnagrostis filiformis s.l.</i>					
	Scaly Buttons	<i>Leptorhynchus squamatus</i>					
	Poison Lobelia	<i>Lobelia pratensis</i>					

Origin	Common Name	Scientific Name	EPBC	FFG	DELWP	CaLP Act	GS Target
*	Wimmera Rye-grass	<i>Lolium rigidum</i>					B
	Dwarf Mat-rush	<i>Lomandra nana</i>					
*	Horehound	<i>Marrubium vulgare</i>				C	A
	Weeping Grass	<i>Microlaena stipoides</i> var. <i>stipoides</i>					
*	Serrated Tussock	<i>Nassella trichotoma</i>				C	B
	Grassland Wood-sorrel	<i>Oxalis perennans</i>					
	Creeping Knotweed	<i>Persicaria prostrata</i>					
*	Toowoomba Canary-grass	<i>Phalaris aquatica</i>					B
	Narrow Plantain	<i>Plantago gaudichaudii</i>					
	Basalt Tussock-grass	<i>Poa labillardierei</i> var. (Volcanic Plains)			k		
	Soft Tussock-grass	<i>Poa morrisii</i>					
	Pussy Tails	<i>Ptilotus spathulatus</i>					
*	Sweet Briar	<i>Rosa rubiginosa</i>				C	
	Wiry Dock	<i>Rumex dumosus</i>					
	Common Wallaby-grass	<i>Rytidosperma caespitosum</i>					
*	Wild Sage	<i>Salvia verbenaca</i>					
	Smooth Solenogyne	<i>Solenogyne dominii</i>					
*	Common Sow-thistle	<i>Sonchus oleraceus</i>					
	Kangaroo Grass	<i>Themeda triandra</i>					
	Yellow Rush-lily	<i>Tricoryne elatior</i>					
*	Narrow-leaf Clover	<i>Trifolium angustifolium</i> var. <i>angustifolium</i>					
*	Squirrel-tail Fescue	<i>Vulpia bromoides</i>					B
	Tufted Bluebell	<i>Wahlenbergia communis</i> s.l.					

Notes:

X = recorded in the study area

* = introduced to Victoria

EPBC = threatened species status under EPBC Act:

EX = presumed extinct in the wild

CR = critically endangered

EN = endangered

VU = vulnerable

FFG = threatened species status under the FFG Act: L = listed as threatened

DELWP = status under DELWP's Advisory List (DEPI 2014):

x = presumed extinct in the wild

cr = critically endangered

e = endangered

v = vulnerable

r = rare

k = insufficiently known

CaLP Act = declared noxious weeds status under the CaLP Act:

S = State Prohibited Weeds (Any infestations are to be reported to DELWP. DELWP is responsible for control of state prohibited Weeds)

P = Regionally Prohibited Weeds (Land owners must take all reasonable steps to eradicate regionally prohibited weeds on their land)

C = Regionally Controlled Weeds (Land owners have the responsibility to take all reasonable steps to prevent the growth and spread of regionally controlled weeds on their land)

R = Restricted Weeds (Trade in these weeds and their propagules, either as plants, seeds or contaminants in other materials is prohibited)

GS Target = listed as gain scoring target weeds in the native vegetation gain scoring manual (DEPI 2013b):

A = high threat weeds that DEPI expects landowners can eliminate to <1% cover, and to the point of no visible plants remaining after 10 years of site management and 6–12 months after the last site treatment

B = high threat weeds that DEPI expects landowners may, in some circumstances, be able to eliminate, where the level of weed abundance allows for elimination to <1% cover

Appendix 2: Landowner monitoring and reporting form

Landowner of offset site	Warrambeen Offset Trust
Location and address of offset site	Warrambeen Estate, Shelford
Offset site number (if applicable)	
Offset plan reference number (if applicable)	
Responsible Authority	Corangamite Shire
Report No.	11212 (4.0)
Signature	
Date	

Please attach a copy of Management Action Table from the Offset Plan with information on which actions have been completed for year/s of this reporting period.

Describe specific monitoring results from surveys undertaken, survival rates of revegetation works, fencing work, success of weed and pest animal control work, successful management tools (i.e. techniques used to control weed species, protection of new plants, monitoring techniques...) and any problems or issues experienced (i.e. new infestation of weed species, storm damage to fencing...).

Provide photographs showing evidence of works.

If any agreed management actions or commitments are incomplete or have not been undertaken in the times specified explain the reasons why and what program of action/s will be undertaken to implement the action. If no action is to be undertaken please explain the reason/s and how the targets specified will be met.

Appendix 3: EVC Benchmarks

Heavier soils Plains Grassland – EVC 132_61

EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 55_61: Plains Grassy Woodland

Description:

An open, eucalypt woodland to 15 m tall. Occupies poorly drained, fertile soils on flat or gently undulating plains at low elevations. The understorey consists of a few sparse shrubs over a species-rich grassy and herbaceous ground layer. This variant occupies areas receiving approximately 500 – 700 mm annual rainfall.

Large trees:

Species	DBH(cm)	#/ha
<i>Eucalyptus</i> spp.	80 cm	8 / ha

Tree Canopy Cover:

%cover	Character Species	Common Name
10%	<i>Eucalyptus camaldulensis</i>	River Red Gum

Understorey:

Life form	#Spp	%Cover	LF code
Immature Canopy Tree		5%	IT
Understorey Tree or Large Shrub	1	5%	T
Medium Shrub	3	10%	MS
Small Shrub	2	1%	SS
Prostrate Shrub	1	1%	PS
Large Herb	3	5%	LH
Medium Herb	8	15%	MH
Small or Prostrate Herb	3	5%	SH
Large Tufted Graminoid	2	5%	LTG
Medium to Small Tufted Graminoid	12	45%	MTG
Medium to Tiny Non-tufted Graminoid	2	5%	MNG
Bryophytes/Lichens	na	10%	BL
Soil Crust	na	10%	S/C

LF Code	Species typical of at least part of EVC range	Common Name
MS	<i>Acacia pycnantha</i>	Golden Wattle
MS	<i>Acacia paradoxa</i>	Hedge Wattle
SS	<i>Pimelea humilis</i>	Common Rice-flower
PS	<i>Astroloma humifusum</i>	Cranberry Heath
PS	<i>Bossiaea prostrata</i>	Creeping Bossiaea
MH	<i>Oxalis perennans</i>	Grassland Wood-sorrel
MH	<i>Gonocarpus tetragynus</i>	Common Raspwort
MH	<i>Acaena echinata</i>	Sheep's Burr
SH	<i>Dichondra repens</i>	Kidney-weed
SH	<i>Hydrocotyle laxiflora</i>	Stinking Pennywort
LTG	<i>Austrostipa mollis</i>	Supple Spear-grass
LTG	<i>Austrostipa bigeniculata</i>	Kneed Spear-grass
MTG	<i>Themeda triandra</i>	Kangaroo Grass
MTG	<i>Elymus scaber</i> var. <i>scaber</i>	Common Wheat-grass
MTG	<i>Austrodanthonia setacea</i>	Bristly Wallaby-grass
MTG	<i>Austrodanthonia racemosa</i> var. <i>racemosa</i>	Stiped Wallaby-grass
MNG	<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass

Recruitment:

Continuous

Organic Litter:

10 % cover

Logs:

10 m/0.1 ha.

EVC 55_61: Plains Grassy Woodland - Victorian Volcanic Plain bioregion

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
MS	<i>Lycium ferocissimum</i>	African Box-thorn	high	high
LH	<i>Cirsium vulgare</i>	Spear Thistle	high	high
LH	<i>Sonchus oleraceus</i>	Common Sow-thistle	high	low
LH	<i>Plantago lanceolata</i>	Ribwort	high	low
MH	<i>Hypochoeris radicata</i>	Cat's Ear	high	low
LNG	<i>Holcus lanatus</i>	Yorkshire Fog	high	high
MTG	<i>Vulpia bromoides</i>	Squirrel-tail Fescue	high	low
MTG	<i>Romulea rosea</i>	Onion Grass	high	low
MTG	<i>Briza minor</i>	Lesser Quaking-grass	high	low
MTG	<i>Briza maxima</i>	Large Quaking-grass	high	low

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Appendix 4: DELWP Offset site report (TBC)

Appendix 5: Photos of the Offset Site



Photograph 1 (left): Small Milkwort in Offset Zone C

Photograph 2 (below): High quality native grassland with emergent basalt in Offset Zone C

