

EPBC 2019/8569 Natural Temperate Grassland of the Victorian Volcanic Plain, Striped Legless Lizard *Delmar impar* and Golden Sun Moth *Synemon plana* Offset Management Plan, [REDACTED]



Final Report Version 4

**Prepared by Biodiversity Offsets Victoria Pty Ltd
on behalf of APT Management Services Pty Limited**

April 2024

Document Control

Report	<i>Natural Temperate Grassland of the Victorian Volcanic Plain, Striped Legless Lizard <i>Delmar impar</i> and Golden Sun Moth <i>Synemon plana</i> Offset Management Plan,</i> [REDACTED] [REDACTED]		
EPBC Act Ref	EPBC 2019/8569		
Project	The Western Outer Ring Main (WORM) high pressure gas pipeline from Plumpton to Lindum Vale, Victoria.		
Proponent	APA VTS Australia (Operations) Pty Limited ABN 65 083 009 278		
Approved Action	The construction and operation of the Western Outer Ring Main (WORM) high pressure gas transmission pipeline between Plumpton and Lindum Vale, northwest of Melbourne CDB, Victoria.		
Report Author	[REDACTED]	Project Number	0421
Mapping	[REDACTED]		
File Name	[REDACTED]		
Version	Final Version 4		
Date	04/04/2024		

Cover Photos: *Natural Temperate Grassland of the Victorian Volcanic Plain*, [REDACTED]
(photo taken by [REDACTED] 25/07/2022), Male Golden Sun Moth (photo taken by [REDACTED]
[REDACTED] 24/12/2018), and a Striped Legless Lizard (photo taken by [REDACTED]
[REDACTED] 24/12/2018).

Disclaimer

Although Biodiversity Offsets Victoria Pty Ltd has taken all the necessary steps to ensure that this document is accurate, and in accordance with relevant legislation and policies, Biodiversity Offsets Victoria Pty Ltd does not accept responsibility for any damages or losses incurred as a result of actions that are undertaken as a result of either the report or its constituent parts.

Declaration of accuracy

I declare that:

1. To the best of my knowledge, all the information contained in, or accompanying this Management Plan (*Natural Temperate Grassland of the Victorian Volcanic Plain, Striped Legless Lizard Delmar impar and Golden Sun Moth Synemon plana Offset Management Plan*, [REDACTED], Final Version 4, 04/04/2024) is complete, current and correct.

2. I am duly authorised to sign this declaration on behalf of the approval holder.

3. I am aware that:

a. Section 490 of the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) makes it an offence for an approval holder to provide information in response to an approval condition where the person is reckless as to whether the information is false or misleading.

b. Section 491 of the EPBC Act makes it an offence for a person to provide information or documents to specified persons who are known by the person to be performing a duty or carrying out a function under the EPBC Act or the Environment Protection and Biodiversity Conservation Regulations 2000 (Cth) where the person knows the information or document is false or misleading.

c. The above offences are punishable on conviction by imprisonment, a fine or both.

[REDACTED]

[REDACTED]
Full Name (please print)

APA VTS (OPERATIONS) PTY LIMITED
Organisation (please print)

9/04/2024
Date

Contents

1	Introduction	5
1.1	Matter of National Environmental Significance.....	5
2	Impact	8
2.1	Location.....	8
2.2	Relevant Ecological Reports.....	8
2.3	Significant Impacts to Matters of National Environmental Significance	8
3	Offset.....	10
3.1	Location.....	10
3.2	Historical Land Use and Disturbance	11
3.3	Previous Ecological Assessments	11
3.4	Description	11
3.5	In Perpetuity Security.....	20
3.6	Offset Management.....	20
4	Offset Management Plan (implementation).....	21
4.1	Offset Objectives.....	21
4.2	Management Actions.....	27
4.3	10-Year Offset Management Plan.....	36
4.4	In Perpetuity Management.....	51
5	EPBC Act Environmental Offsets Policy.....	56
	Figures	58
	References	61
	Appendices.....	65

1 Introduction

APA VTS Australia (Operations) Pty Limited (APA) proposes to construct and operate the Western Outer Ring Main (WORM), a high pressure gas transmission pipeline (the Project). The project will require the installation of 51km of 500 millimetre nominal diameter high pressure transmission pipeline from Plumpton to Lindum Vale, to provide high pressure connection between the eastern and western pipeline networks of the Victorian Transmission System (VTS).

The Project proposes impacts to *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed *Matters of National Environmental Significance* (MNES). The *Western Outer Ring Main Ecological Offset Strategy* summarises the offsets proposed to compensate for impacts to all relevant MNES (APA 2022). One of these offsets is a grassland site located at [REDACTED]. The Cressy grassland offset is proposed to compensate for impacts to three MNES: *Natural Temperate Grassland of the Victorian Volcanic Plain* (NTGVVP), Striped Legless Lizard *Delmar impar* and Golden Sun Moth *Synemon plana* (Table 1). Other offsets are being proposed to compensate for impacts to MNES that do not occur at the Cressy offset. This Offset Management Plan (OMP) outlines the proposed [REDACTED] offset, its ecological values, proposed in-perpetuity security arrangement and 10-year offset management plan.

Table 1. Proposed impact and offset for MNES relevant to the [REDACTED]

Matter of Environmental Significance	Impact		Offset	
	Area	Quality	Area	Quality
<i>Natural Temperate Grassland of the Victorian Volcanic Plains</i> (NTGVVP)	4.52 ha	3/10	33 ha	6/10
Golden Sun Moth <i>Synemon plana</i> habitat	19.93 ha	5/10	128 ha	6-7/10
Striped Legless Lizard <i>Delmar impar</i> habitat	39.92 ha	6/10	153 ha	8-9/10

1.1 Matter of National Environmental Significance

The MNES relevant to the impact and proposed offset [REDACTED] are described below.

1.1.1 *Natural Temperate Grassland of the Victorian Volcanic Plain*

Natural Temperate Grassland of the Victorian Volcanic Plains (NTGVVP) is an ecological community listed as critically endangered under the EPBC Act. NTGVVP occurs on the fertile and poorly drained basalt soils in the Victorian Volcanic Plain bioregion that extends from the north and west of Melbourne to far-west Victoria (DAWE 2021). It is dominated by native tussock-forming perennial grasses, including Kangaroo-grass *Themeda triandra*, Wallaby-grasses *Rytidosperma* spp., Spear-grasses *Austrostipa* spp. and Tussock-grasses *Poa* spp., with native herbs, mostly from the daisy (*Asteraceae*), lily (*Anthericaceae*, *Asphodelaceae*, *Phormiaceae*), pea (*Fabaceae*) and orchid (*Orchidaceae*) families, occupying inter-tussock spaces. Native shrubs and trees are absent or sparse. NTGVVP is a dynamic and inherently variable ecological community. Its species richness and composition are subject to seasonal and climatic conditions, weather patterns, site and land management practices (TSSC 2008).

NTGVVP has been listed as critically endangered under the EPBC Act, as its original area of occupancy has reduced by more than 98% from clearance primarily for agriculture, including livestock grazing and cropping, and urbanisation. Remaining areas of NTGVVP continue to be threatened by these land uses, weed invasion, fragmentation and other pressures (TSSC 2008: CES 2018).

1.1.2 Golden Sun Moth

The Golden Sun Moth is listed as vulnerable under the EPBC Act. It is a medium-sized, diurnal moth with a wingspan up to 3.4 cm. They spend most of their lifecycle underground in a larval stage, feeding on the roots of Wallaby-grasses *Rytidospema* spp. However, the species may also inhabit degraded grasslands dominated by the exotic Chilean Needle-grass *Nassella neesiana*, a Weed of National Significance (WONS). Adults emerge during summer to breed, with males flying approximately one metre above the grass actively searching for a female. Adult moths generally survive for one to four days as they lack functional mouth parts (DAWE 2021).

The distribution of Golden Sun Moths corresponds with native temperate grassland and open grassy woodlands communities dominated by Wallaby-grasses across NSW, ACT, Victoria and South Australia (DCCEEW 2022b). The species is listed as vulnerable under the EPBC Act as its grassland habitat has been historically fragmented, leading to reduced genetic diversity amongst remaining populations and is susceptible to ongoing threats.

Other typical native grasses in Golden Sun Moth habitat may include Spear-grasses, Tussock Grasses, Weeping Grass *Microtena* spp., Wire-grasses *Aristida* spp. and Kangaroo Grass. Habitat containing a high cover ($\geq 40\%$) of suitable host plants combined with well drained and north facing sites, with minimal shading, are preferred by the species. Areas of bare or sparsely covered ground between grass tussocks (inter-tussock spaces) are important in helping males locate females during the breeding period (October-January) (DAWE 2021).

1.1.3 Striped Legless Lizard

The Striped Legless Lizard is listed as Vulnerable under the EPBC Act. It is a member of the family Pygopodidae, the legless or flap footed lizards (Cogger 2000). It is up 300mm in length and is typically pale grey-brown above and cream below, with the head darker than the body and a series of stripes along the sides of the body which become diagonal bands on the tail. Other distinguishing features of this species are visible ear openings, a rounded tongue and the presence of scaly hind limb flaps.

Striped Legless Lizards are usually found in native tussock grasslands and woodland (Wilson and Swan 2010), often dominated by species such as Spear Grass *Austrostipa bigeniculata* and Kangaroo Grass *Themeda triandra* (Smith and Robertson 1999). However recent observations of the species have demonstrated that non-native plant species, and even secondary grasslands, can support individuals of this species (Smith and Robertson 1999). This has led to a hypotheses that it is not the provenance of the grass species that is important, rather the structural characteristics of the vegetation that determines if the habitat is suitable for Striped Legless Lizards (DSE 2011; Smith and Robertson 1999). Within these habitats, Striped Legless Lizards are usually found sheltering underneath logs, rocks and other debris (Cogger 2000).

The Striped Legless Lizard was formerly distributed throughout temperate lowland grasslands in southern Australia (SEWPaC 2013). In Victoria, it is believed that the range of the species has contracted to southern parts of its former range, although it is no longer found close to inner metropolitan Melbourne. There are likely to be more than 1000 individuals of this species remaining in the wild, most of which occur in large reserves within the Victorian Volcanic Plain, although the precise size of the population is not known. The species has been listed as Vulnerable under the EPBC Act as it is dependent on grassland habitat that is under threat of ongoing loss, degradation and fragmentation (TSSC 2016).

2 Impact

APA VTS Australia (Operations) Pty Limited (APA) proposes to construct and operate the Western Outer Ring Main (WORM): a 500-millimetre, high pressure gas transmission pipeline from Plumpton to Lindum Vale (the Project). The Project will provide high pressure connection between the eastern and western pipeline networks of the Victorian Transmission System (VTS). The proposed development footprint is 51 kilometres in length and covers areas of native vegetation and habitat. It has been sited to avoid native vegetation and impacts to MNES where feasible (APA 2022). The project involves residual impacts to two EPBC Act listed ecological communities, NTGVVP and *Grassy Eucalypt Woodland of the Victorian Volcanic Plains* (GEWVVP), and two EPBC Act listed species, Golden Sun Moth and Striped Legless Lizard (APA 2022). Impacts to GEWVVP are proposed to be compensated for through another EPBC Act offset site not covered in this EPBC Act OMP.

2.1 Location

The development footprint is 51 kilometres in length, covering urban and agricultural land, waterways, and native and non-native vegetation and habitat, between APA's Plumpton Regulating Station and the Wollert Compressor Station (GHD 2021; Figure 1). The impact area is situated in the Port Phillip and Westernport Catchment Management Authority, the Victorian Volcanic Plain and Central Victorian Upland bioregions, and the Melton, Hume, Mitchell and Whittlesea municipalities.

2.2 Relevant Ecological Reports

The impact site has undergone a series of biodiversity assessments and threatened species surveys since 2019. The following ecological reports outline the methods and findings of these assessments, the targeted surveys undertaken for relevant MNES, the assessment of significant impacts to MNES, and proposed EPBC Act offsets:

1. *Western Outer Ring Main (WORM) Environment Effects Statement Technical Report A - Biodiversity and Habitats Report* (GHD 2021);
2. *Western Outer Ring Main Gas Pipeline Inquiry - Technical Note No. 15 – Ecology assessment of Revision 10 alignment changes* (APA 2021); and,
3. *Western Outer Ring Main Ecological Offset Strategy* (APA 2022).

2.3 Significant Impacts to Matters of National Environmental Significance

APA (2022) outlines the assessment of significant impacts to EPBC Act listed NTGVVP, GEWVVP, Golden Sun Moth and Striped Legless Lizard, and the steps taken to avoid and/or minimise impacts to MNES. The following residual impacts to MNES are proposed to be offset in accordance with the WORM Offset Strategy:

- 4.52 ha of NTGVVP;
- 2.09 ha of GEWVVP;
- 19.93 ha of Golden Sun Moth habitat; and,
- 39.92 ha of Striped Legless Lizard habitat.

No other MNES are proposed to be impacted through the construction and operation of the Project. This OMP outlines the proposed offset to compensate for the residual impacts above NTGVVP, Golden Sun Moth and Striped Legless Lizard.

3 Offset

A suitable offset has been identified to compensate for the proposed impacts to EPBC Act listed NTGVVP, Golden Sun Moth and Striped Legless Lizard outlined in Section 2. Section 3 outlines the offset available and Section 4 details the offset management plan to be implemented at the offset site to achieve the offset required. Table 2 below summarises the current offset site, and the proposed security and management arrangement to secure the offset required.

Table 2. Offset Site Security and Management

Address	
Allotment	
Victorian Bioregion	Victorian Volcanic Plain
Catchment Management Authority	Corangamite
Local Government Area	Colac Otway
Current Zoning	Farm Zone
Planning Overlays	None
Current Security	None
Proposed Security	A Section 173 Agreement under the <i>Planning and Environment Act 1987</i> to be secured on-title in lieu of the establishment of a Trust for Nature Offset Covenant covering 153 hectares.
Offset Management Period	10 years (to commence following registration of Section 173 Agreement on-title)
Offset Site Management Responsibility	Landowner
Offset Monitoring Responsibility	Landowner, APA VTS Australia (Operations) Pty Limited, Colac Otway Shire and Trust for Nature

3.1 Location

The offset site is located approximately 98 kilometres west of the impact site, on a sheep grazing property at [REDACTED]. The property is approximately 275 hectares in size, and the offset site is 153 hectares (Figure 2). Two other approved EPBC Act offsets (EPBC 2019/8428 & EPBC 2018/8260), covering 33 and 31 hectares respectively, are located in the east of the property (in Lot 5 LP7127).

The property is bordered by Hamilton Highway along its southern boundary, a disused government road along its eastern boundary, and farmland along its western and northern boundaries (Figure 2). The offset site is situated in the Colac Otway Shire Council, Corangamite Catchment Management Authority and Victorian Volcanic Plain bioregion. The offset site is zoned Farming Zone (FZ), which allows grazing of domestic livestock, and does not contain any planning overlays restricting current land uses.

3.2 Historic Land Use and Disturbance

The property has had a long history (more than 100 years) of sheep grazing, and the Landowner has advised that the site has mostly undergone a set-stocked grazing regime for the last 20 years or more. The property, including the offset site, presents no evidence of significant ground disturbance (ie. cropping or rock removal), nor recent fertiliser or broad acre herbicide application (Biosis 2019; SMEC 2019).

3.3 Previous Ecological Assessments

The offset was assessed on 25 July 2022 for the purposes of determining offset suitability and management requirements. The entire property underwent a vegetation assessment on 19 October and 21 November 2018 (Biosis 2019), and targeted species surveys for Golden Sun Moth between 19 November and 12 December 2018 and Striped Legless Lizard population monitoring on 29 October 2018 (EHP 2019). The following ecological reports outline the methods and findings of these assessments:

1. 

2. 
3. 
 

3.4 Description

The offset site comprises 153 hectares of native grassland vegetation, that forms part of a contiguous 262.84-hectare area of grassland habitat. Biosis (2019) undertook Vegetation Quality (Habitat Hectares) Assessment in accordance with Victorian Government methodology (DSE 2004), and identified two habitat zones that support Ecological Vegetation Class (EVC) 132 Plains Grassland of the Victorian Volcanic Plain (VVP) bioregion (DELWP 2022a) of different vegetation and habitat quality. Tables 3-5 outline the vegetation and habitat quality of each habitat zone. 108.06 hectares of habitat zone 1 (HZ1) and 44.94 hectares of habitat zone 2 (HZ2) are proposed for the 153-hectare offset.

The vegetation in habitat zone 1 meets the minimum condition thresholds to qualify for the EPBC Act listed NTGVVP (TSSC 2008; Biosis 2019; Table 6). Both HZ1 and HZ2 provide suitable habitat for the EPBC Act listed Golden Sun Moth (TSSC 2002; Table 7) and Striped Legless Lizard (TSSC 2016; Table 8). Approximately 2969 male Golden Sun Moths were recorded during a targeted species survey undertaken throughout the property from November to December 2018 (SMEC 2019), and 30 Striped Legless Lizards and two skins were recorded during a targeted survey in October 2018 (EHP 2019) (Figure 2).

Table 3. Vegetation Quality Assessment (Biosis 2019) (Appendix 1; DSE 2004).

Vegetation Quality (Habitat Hectare) Assessment			HZ1	HZ2
EVC name			Plains Grassland	Plains Grassland
EVC Number			132_61	132_61
Bioregion			Victorian Volcanic Plain	Victorian Volcanic Plain
	Max Score		Score	Score
Site Condition Score	Large Old Trees	10	NA	NA
	Canopy Cover	5	NA	NA
	Understorey	25	15	15
	Lack of Weeds	15	6	2
	Recruitment	10	10	3
	Organic Matter	5	5	3
	Logs	5	NA	NA
	Standardiser		1.36	1.36
	Total Site Condition Score	75	49.09	31.36
Landscape value	Patch Size	10	8	8
	Neighbourhood	10	2	2
	Distance to Core	5	4	4
	Total Landscape Score	25	14	14
Habitat points out of 100		100	63.09	45.36
Habitat (Quality) Score out of 10		10	6	5
WORM Offset Area (ha)			108.06	44.94

Table 4. Assessed GSM habitat quality (Appendix 2; APA 2022; Biosis 2020a).

Golden Sun Moth Habitat Quality Assessment		HZ1	HZ2
	Max		
Site condition	3	3	2
Site context	3	2	2
Species stocking rate	4	2	2
Habitat Quality out of 10	10	7	6

Table 5. Assessed and improved SLL habitat quality (Appendix 3; APA 2022; Biosis 2020b).

Striped Legless Lizard Habitat Quality Assessment		HZ1	HZ2
	Max		
Site condition	3	3	2
Site context	4	3	3
Species stocking rate	3	3	3
Habitat Quality out of 10	10	9	8

Habitat Zone 1

HZ1 vegetation is dominated by a variety of native grasses, including Wallaby-grasses *Rytidosperma* spp., Kangaroo Grass *Themeda triandra*, Spear grasses *Austrostipa* spp., Tussock-grasses *Poa* spp., Common Wheat-grass *Anthosachne scabra*, Long-hair Plume-grass *Dichelachne crinita*, and Blown-grass *Lachnagrostis* spp., with native Rush *Juncus* spp. and a variety of native herbs, including Sheep's Burr *Acaena echinata*, Common Woodruff *Asperula conferta*, Lemon Beauty-heads *Calocephalus citreus*, Cut-leaf Burr-daisy *Calotis anthemoides*, Bindweed *Convolvulus angustissimus*, Sundew *Drosera* spp., Cut-leaf Goodenia *Goodenia*

pinnatifida, Scaly Buttons *Leptorhynchus squamatus*, Kidney-weed *Dichondra repens*, Blue Devil *Eryngium ovinum*, Varied Raspwort *Haloragis heterophylla*, Narrow Plantain *Plantago gaudichaudii*, Yam Daisy *Microseris scapigera* and Smooth Solenogyne *Solenogyne domini* (Plates 1-7; Biosis 2019). No indigenous trees or shrubs have been recorded in HZ1.

HZ1 also comprises a moderate (40-45%) cover of introduced grasses and herbaceous weeds, including Brome *Bromus* spp., Hair-grass *Aira* spp., Fescue *Vulpia* spp., Toowoomba Canary-grass *Phalaris aquatica*, Yorkshire Fog *Holcus lanatus*, Flatweed *Hypochaeris radicata*, Onion Grass *Romulea rosea*, Buck's-horn plantain *Plantago coronopus*, Capeweed *Arctotheca calendula*, Sow-thistle *Sonchus* spp. and Clovers *Trifolium* spp. One declared noxious weed, Spear Thistle *Cirsium vulgare*, was recorded in HZ1 during the offset site assessment, and three other noxious weeds, Chilean Needle-grass *Nassella neesiana* (also a Weed of National Significance – WoNS), Serrated Tussock *Nassella trichotoma* (also a WoNS) and Bathurst Burr *Xanthium spinosum*, also occur in the larger property. Paddy Melon *Cucumis myriocarpus* was not recorded during the site assessment, but is known to occur annually on site.

HZ1 vegetation meets the minimum condition thresholds for NTGVVP, and provides suitable habitat for Golden Sun Moth and Striped Legless Lizard (Tables 6-8). It comprises good inter-tussock spacing (greater than 20%) amongst a variety of native tussock grasses, including Wallaby and Spear grass, for the Golden Sun Moth. The high diversity in native tussock-forming grasses and native herbs, with embedded or surface rock, provides good structural complexity for the Striped Legless Lizard.



Plate 1 NTGVVP, and Golden Sub Moth and Striped Legless Lizard habitat, Habitat zone 1 (photo taken by [REDACTED] 25/7/2022)



Plate 2 NTGVVP, and Golden Sub Moth and Striped Legless Lizard habitat, HZ1 (photo taken by [REDACTED] 25/7/2022)



Plate 3 Inter-tussock space, HZ1 (photo taken by [REDACTED] 7/2022)



Plate 4 Native Beauty-head and Narrow Plantain, HZ1 (photo taken by [REDACTED] 25/7/2022)



Plate 5 Flatweed amongst native grasses and herbs, HZ1 (photo taken by [REDACTED] 25/7/2022)



Plate 6 Uncontrolled sheep grazing, HZ1 (photo taken by [REDACTED] 25/7/2022)

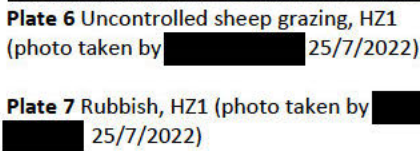


Plate 7 Rubbish, HZ1 (photo taken by [REDACTED] 25/7/2022)



Habitat Zone 2

HZ2 vegetation is dominated by a variety of native grasses, including Wallaby-grasses *Rytidosperma* spp., Kangaroo Grass, Spear grasses *Austrostipa* spp., Tussock-grasses *Poa* spp., Common Wheat-grass *Anthosachne scabra* and, with native Rush *Juncus* spp. and some native herbs, including Bindweed *Convolvulus angustissimus* and Blue Devil *Eryngium ovinum* (Plates 8-4). No indigenous trees or shrubs have been recorded in HZ2.

The vegetation also comprises a high (50-60%) cover of introduced grasses and herbaceous weeds, including Rye-grass *Lolium* spp., Brome, Barely Grass, Toowoomba Canary-grass, Flatweed, Capeweed *Arctotheca calendula* and Sow-thistle *Sonchus* spp. Two declared noxious weeds, Spear Thistle and Chilean Needle-grass, occur in HZ2, and two others, Serrated Tussock (also a WoNS) and Bathurst Burr, occur in the larger property.

HZ2 does not meet the minimum condition thresholds for NTGVVP, but it does provide suitable habitat for Golden Sun Moth and Striped Legless Lizard (Tables 6-8). It comprises some inter-tussock spacing (less than 20%) amongst native tussock grasses, including Wallaby and Spear grass, for the Golden Sun Moth, and some structural complexity for the Striped Legless Lizard, through a moderate diversity of native grasses and herbs, and embedded or surface rock.



Plate 8 Native Grassland vegetation, and Golden Sun Moth and Striped Legless Lizard habitat, when Wallaby-grass in flower, HZ2 (photo taken by [REDACTED] 15/12/2021)



Plate 2 Native Grassland vegetation, and Golden Sun Moth and Striped Legless Lizard habitat, HZ2 (photo taken by [REDACTED] 25/7/2022)

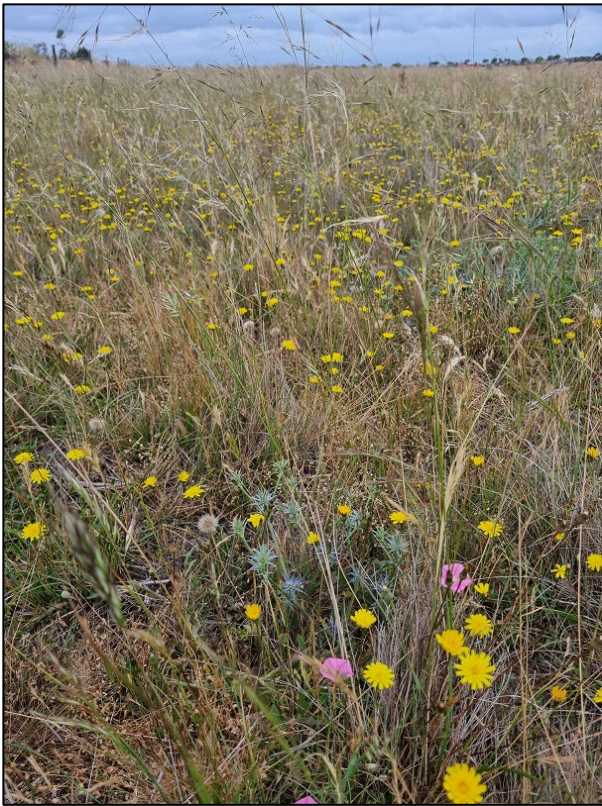


Plate 3 Flatweed amongst native grasses and herbs, HZ2 (photo taken by [REDACTED] 15/12/2021)



Plate 4 Striped Legless Lizard survey tile, HZ2 (photo taken by [REDACTED] 15/12/2021)

Table 6. Response to Condition Thresholds for EPBC Act listed *Natural Temperate Grassland of the Victorian Volcanic Plain* (NTGVVP) (TSSC 2008).

	NTGVVP Condition Thresholds	HZ1	HZ2
Vegetation Description	Natural Temperate Grassland of the Victorian Volcanic Plain is mostly limited to a ground layer of grasses and herbs. Large shrubs and trees are absent to sparse. The ground layer is dominated by native tussock-forming perennial grasses with a variety of herbs, mostly from the daisy (<i>Asteraceae</i>), lily (<i>Anthericaceae</i> , <i>Asphodelaceae</i> , <i>Phormiaceae</i>), pea (<i>Fabaceae</i>) and orchid (<i>Orchidaceae</i>) families, occupying the spaces among grass tussocks. The main grass species present are Kangaroo-grass <i>Themeda triandra</i> , particularly on drier sites, Wallaby-grasses <i>Rytidosperma</i> spp., Spear-grasses <i>Austrostipa</i> spp. and Tussock-grasses <i>Poa</i> spp.. Low gradient ephemeral and intermittent drainage lines may be dominated by a dense sward of the Tussock-grass <i>Poa labillardierei</i> .	HZ1 supports native grassland vegetation dominated (>60% cover) by native tussock-forming perennial grasses (Kangaroo Grass, Spear-grasses, Tussock-grass and Wallaby-grasses) and a diversity of native herbs.	HZ2 comprises native grassland vegetation (40-50% cover), including native grasses (Kangaroo Grass, Spear-grasses, Tussock-grass and Wallaby-grasses) and herbs, but is dominated by introduced grasses and herbaceous weeds.
Ecological Vegetation Classes (EVCs)	The native vegetation within the site includes one or both of the following EVCs: Plains Grassland (EVC 132) or Creekline Tussock Grassland (EVC 654).	Both habitat zones support Plains Grassland (EVC 132) vegetation.	
Bioregions	Site is in the Victorian Volcanic Plain or near to the Victorian Volcanic Plain (Central Victorian Uplands, Dundas Tablelands and Otway Plain Bioregions)	The property is within the Victorian Volcanic Plain	
Size of Patch	If grassland remnant is ≤1 hectare, grassland patch needs to be at least 0.05 hectares in size with no more than 5% canopy cover of trees or shrubs. If grassland remnant is >1 hectare, grassland patch needs to be at least 0.5 hectares in size with no more than 2 trees per hectare.	The offset site forms part of a contiguous 262.84 hectare patch of native grassland. No woody vegetation has been recorded in the site.	
Condition Thresholds	One or more of the following native grass genera accounts for at least 50% of the perennial ground layer cover: <i>Themeda</i>, <i>Rytidosperma</i>, <i>Austrostipa</i>, <i>Poa</i> and/or <i>Microleana</i>. OR Native wildflowers account for 50% or more of the total vegetation from September to February. OR Non-grassy weeds account for less than 30% of the total vegetation cover at any time of the year.	Perennial native grass genera, including <i>Themeda</i> , <i>Rytidosperma</i> , <i>Austrostipa</i> and <i>Poa</i> , make up for more than 50% of the vegetative cover across the site.	Perennial native grass genera, including <i>Themeda</i> , <i>Rytidosperma</i> , <i>Austrostipa</i> and <i>Poa</i> , or native wildflowers, <u>do not</u> make up for more than 50% of the vegetative cover across the site.
Additional Characteristics	The conservation value of a patch of the ecological community is enhanced if it shows any of the following features: ▪ A high native plant species richness; ▪ Large patch size or connectivity with a large patch of remnant vegetation; ▪ Minimal weed invasion; ▪ Presence of threatened plant and/or animal species; ▪ Presence of natural exposed rock platforms and outcrops; or ▪ Presence of mosses, lichens or a soil crust on the soil surface.	The offset site forms part of very large patch of native grassland vegetation, with rocky outcrops and a diversity of native plant species. This site also provides habitat for EPBC listed Golden Sun Moth and Striped Legless Lizard.	

Table 7. Response to Habitat Condition Thresholds of the EPBC Act listed Golden Sun Moth *Synemon plana* (DAWE 2021; TSSC 2002).

	Golden Sun Moth Habitat Condition Thresholds	HZ1	HZ2
Location	Important populations known to occur in Victoria: -Victorian Midlands -Southern Volcanic Plain -South East Coastal Plain IBRA Bioregions -Port Phillip and Westernport CMA -Glenelg Hopkins CMA -North Central CMA	The property is located in the Southern Victorian Volcanic Plain	
Vegetation Type	Native Grasslands associated with the following EPBC Act listed ecological communities in Victoria: -Natural Temperate Grassland of the Victorian Volcanic Plain -Grassy Eucalypt Woodland of the Victorian Volcanic Plain -White Box-Yellow Box-Blakely's Red Gum Grassy Woodland -Grey Box (Eucalyptus macrocarpa) Grassy Woodlands and -Derived Native Grasslands of South-eastern Australia	HZ1 supports Natural Temperate Grassland of the Victorian Volcanic Plain	HZ2 supports native grassland associated with Natural Temperate Grassland of the Victorian Volcanic Plain, but does not meet the condition threshold for this community (Biosis 2019).
Habitat Requirements	Native grassland with at least 40% cover of Wallaby Grasses <i>Rytidosperma</i> spp. and/or Spear Grasses <i>Austrostipa</i> spp. OR	HZ1 supports native grasslands with at least 40% cover of Wallaby Grass and Spear Grass species. No Chilean Needle Grass was recorded at the site.	HZ2 supports native grasslands with at least 40% cover of Wallaby Grass and Spear Grass species, and a small (8m ²) infestation of Chilean Needle Grass.
	Introduced pastures with at least 40% cover of Chilean Needle Grass <i>Nasella neesiana</i> .		
Size of Habitat	Site forms part of a large area (minimum area not known) of habitat, or provides connectivity to larger areas, and is subject to conservation management.	The offset site forms part of a large 262.84-hectare patch of native grassland vegetation, and will be subject to conservation management.	
Species Presence	Appropriate targeted surveys have been undertaken (DSE 2010), which confirmed presence of an important population of Golden Sun Moth. OR	Approximately 2696 male Golden Sun Moths were recorded during a targeted species survey undertaken at the property from November to December 2018 (SMEC 2019), this included records throughout HZ1 and HZ2, approximately 55 Golden Sun Moths were also recorded during the vegetation assessment, found across both HZ1 and HZ2, in November 2018 (Biosis 2019).	
	Previous records of Golden Sun Moth show a high density of moths within the vicinity, and the site is large in size and has at least 40% cover of native Wallaby and/or Spear Grasses, or introduced Chilean Needle Grass.		
Security	Site to be secured under an on-title security agreement to protect the site from development and to manage it for conservation in perpetuity.	The offset site will be secured under a Section 173 Agreement and subsequently a Trust for Nature Offset Covenant.	

Table 8. Response to Habitat Condition Thresholds of the EPBC Act listed Striped Legless Lizard *Delma impar* in the offset site 1 (TSSC 2016).

	Striped Legless Lizard Habitat Condition Thresholds	HZ1	HZ2
Location	Important populations known to occur in Victoria: -North Melbourne, Vic -West Melbourne, Vic -East and West Volcanic Plains, Vic -North Ballarat, Vic -East Grampians, Vic -Northern alluvial plains, Vic -North eastern slopes, Benalla, Vic -Horsham, Vic -North eastern slopes, Alexandra, Vic -South-east Bendigo, Vic	The property is located in the Victorian Volcanic Plain	
Vegetation Type	Native Grasslands associated with the following EPBC Act listed ecological communities: - <i>Natural Temperate Grassland of the Victorian Volcanic Plain</i> - <i>Grassy Eucalypt Woodland of the Victorian Volcanic Plain</i> - <i>Natural Temperate Grassland of the South Eastern Highlands</i> - <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland</i>	HZ1 supports <i>Natural Temperate Grassland of the Victorian Volcanic Plain</i>	HZ2 supports native grassland associated with <i>Natural Temperate Grassland of the Victorian Volcanic Plain</i> , but does not meet the condition threshold for this community (Biosis 2019).
Habitat Quality	Native grassland with a high structural complexity and floristic diversity to provide for breeding, foraging and refuge, including tussock grasses, surface rocks, and anthropod burrows or cracking soils	HZ1 supports native grasslands with a good structural complexity and high floristic diversity, including native tussock grasses, rushes, herbs, surface rock and cracking soils.	HZ2 supports native grasslands with moderate structural complexity and floristic diversity, including native tussock grasses, rushes, herbs, surface rock and cracking soils.
Size of Habitat	Site forms part of a large (>0.5 hectares, non-urban) area of habitat and is connected to breeding habitat or areas subject to conservation management.	The offset site forms part of a large 262.84-hectare patch of native grassland vegetation, providing connectivity between breeding, foraging and refuge habitat, and will be subject to conservation management.	
Species Presence	Appropriate targeted surveys have been undertaken (SEWPaC 2011), which confirmed presence of an important population of Striped Legless Lizards. OR	30 Striped Legless Lizards were recorded across the entire (262.84 hectare) patch of native grassland vegetation in 2019 (EHP 2019). 25 Striped Legless Lizards were recorded across the grassland in 2018 (Biosis 2019). Records were located throughout HZ1 and HZ2.	

	Previous records of Striped Legless Lizards show a high density of lizards on site or nearby, and the site is large in size and has complex grass structures and refuges.	Striped Legless Lizards have also been previously recorded within 5km of the offset (DELWP 2022b).
Security	Site to be secured under an on-title security agreement to protect the site from development and to manage it for conservation in perpetuity.	The offset site will be secured under a Section 173 Agreement and subsequently a Trust for Nature Offset Covenant.

3.5 In Perpetuity Security

The offset site will be permanently secured under a Trust for Nature (TfN) Deed of Covenant for the Conservation of Land. This security mechanism meets the requirements under the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy* (SEWPaC 2012). Under the *Victorian Conservation Trust Act 1972*, the TfN Deed of Covenant will restrict permitted land uses and oblige the landowner to protect and improve native vegetation and habitat for the purpose of generating Commonwealth biodiversity offsets in perpetuity.

Due to the significant time taken to register a TfN Offset Covenant on-title (more than 12 months), the Colac Otway Shire have agreed to register a Section 173 Agreement on the land title to secure the offset in lieu of the TfN Offset Covenant registration. This approach will avoid significant delays in the commencement of the offset, which would otherwise occur, and therefore in the WORM Project. The Section 173 Agreement will be removed from title once evidence that the TfN Deed of Covenant is secured on-title is provided to the Colac Otway Shire.

3.6 Offset Management

The offset site will be managed by the landowner in accordance with the 10-year offset management plan and the in perpetuity management requirements detailed in Section 4 below. The landowner has over 10 years of experience in successfully implementing and managing offsets for MNES in partnership with TfN, including NTGVVP, Golden Sun Moth and Striped Legless Lizard.

4 Offset Management Plan (implementation)

4.1 Offset Objectives

The primary objectives of the offset management plan are as follows:

Objective 1: Secure and manage the offset site for conservation purposes in perpetuity

A TfN Deed of Covenant for the Conservation of Land will provide permanent administrative protection to the offset site through restricting allowable land uses to conservation purposes only. This on-title security will protect the site from agriculture or development activities that would impact MNES on site. The offset site will also be protected from uncontrolled livestock access, unauthorised vehicle access and threats from adjacent farmland, such as spray drift. Sheep will access the offset site under a controlled grazing regime for the purposes of biomass control and weed management only, discussed further in sections 4.2.4 and 4.2.5 below.

The process to secure a TfN Offset Covenant on the land title takes at least 12 months. To ensure that the offset site is adequately protected and managed in accordance with this OMP in lieu of final TfN Offset Covenant registration, the landowner will enter into a Section 173 (*Planning and Environment Act 1987*) Agreement with the Colac Otway Shire municipality. The Section 173 Agreement will be legally binding and oblige the landowner to implement the offset in accordance with the approved EPBC Act OMP.

Objective 2: Achieve a gain in native vegetation and habitat to compensate for the impact

The offset site at [REDACTED] comprises 153 hectares of Striped Legless Lizard habitat, 128 hectares of Golden Sun Moth habitat, and 33 hectares of NTGVVP in total. Table 9 summarises the MNES offset areas proposed to compensate for impacts from the Project, including the habitat zone area that each MNES offset will occupy (Figure 2). Gains in all three MNES will be achieved in 108.06 hectares of HZ1, and gains in Striped Legless Lizard and Golden Sun Moth only will be achieved in 44.94 hectares of HZ2.

Table 9. Proposed impact and offset for MNES at the Cressy Offset.

Matter of Environmental Significance	Impact		Offset			
			HZ1		HZ2	
	Area (ha)	Quality	Area (ha)	Quality	Area (ha)	Quality
Natural Temperate Grassland of the Victorian Volcanic Plains (NTGVVP)	4.52	3/10	33	6/10	0	5/10
Golden Sun Moth <i>Synemon plana</i> habitat	19.93	5/10	108.06	7/10	19.94	6/10
Striped Legless Lizard <i>Delmar impar</i> habitat	39.92	6/10	108.06	9/10	44.94	8/10

Gains in NTGVVP (HZ1)

To compensate for impacts to 4.52 hectares of NTGVVP, 33 hectares of HZ1 will undergo conservation management in accordance with this OMP to avoid decline in its current extent and quality over the 10-year offset management period, to be maintained in perpetuity. Given native grassland ecosystems are declining at a significant rate in Victoria (14% loss in extent was recorded from 2005 to 2015, CES 2018), and are under ongoing threats from the intensification and expansion of agricultural production and urban development, the protection and maintenance of remaining areas of NTGVVP is of significant value to the conservation of this critically endangered community. Table 10 outlines the current vegetation quality of the proposed NTGVVP offset area in HZ1, and the projected decline in quality in 10 years without the offset, and the projected quality with the offset.

The offset site is situated in the Farming Zone and does not contain any overlays restricting land use. The projected decline in quality without the offset from 6/10 to 5/10 assumes that the historic grazing practices will continue with a goal of primary production, and not conservation. This decline would result from long-term degradation of native vegetation and habitat under detrimental grazing practices that are not targeted under biodiversity protection legislation, including over-grazing of native herbs and grasses in spring and summer and other dry periods, under-grazing (or lack of biomass control) of introduced grasses and herbaceous weeds during high-growth (wet) periods, uncontrolled vectors for pest plants and animals, soil disturbance, and fertilizer and broad-acre herbicide application. These practices have been shown to promote the spread of introduced annual grasses and herbaceous weeds (impacting 'lack of weeds' score), reduce the extent and diversity of native grassland species (impacting 'understorey' score), reduce soil crust (for recruitment and habitat) and limit native organic litter (impacting 'organic litter' score) available for decomposition (Tumble and Fraser 1932; Dorrough et al 2004 & 2008a).

Table 10. Assessed and future projected vegetation quality, with and without the proposed offset (Appendix 1)

Vegetation Quality Assessment			HZ1		
			Assessed Vegetation Quality	Projected Quality without Offset Assessed	Projected Quality with Offset
EVC name			Plains Grassland	Plains Grassland	Plains Grassland
EVC Number			132_61	132_61	132_61
Bioregion			Victorian Volcanic Plain	Victorian Volcanic Plain	Victorian Volcanic Plain
		Max Score	Score	Score	Score
Site Condition Score	Large Old Trees	NA	NA	NA	NA
	Canopy Cover	NA	NA	NA	NA
	Understorey	15	15	10	15
	Lack of Weeds	6	6	2	6
	Recruitment	10	10	10	10
	Organic Matter	5	5	2	5
	Logs	NA	NA	NA	NA
	Standardiser	1.36	1.36	1.36	1.36
	Total Site Condition Score	48.96	48.96	32.64	48.96
Landscape value	Patch Size	8	8	8	8
	Neighbourhood	2	2	2	2
	Distance to Core	4	4	4	4
	Total Landscape Score	14	14	14	14
Habitat points out of 100		100	62.96	46.64	62.96
Habitat (Quality) Score out of 10		10	6	5	6
NTGVVP Offset Area (ha)			33	33	33

Gains in Golden Sun Moth habitat (HZ1 and HZ2)

To compensate for impacts to 19.93 hectares of Golden Sun Moth habitat, 128 hectares (108.06 hectares of HZ1 and 19.94 hectares of HZ2) will undergo conservation management in accordance with this OMP to avoid future decline in the extent and quality of Golden Sun Moth habitat. Table 11 outlines the assessed habitat quality of the proposed Golden Sun Moth offset in accordance with the Golden Sun Moth habitat quality assessment methodology (Appendix 2; Biosis 2020a), and the projected decline in quality in 10 years with and without the offset. The current habitat quality for Golden Sun Moth is high at 7/10 in HZ1 and 6/10 in HZ2, predominantly due to the high cover of native tussock grasses (>40%), moderate species population density and distribution, and moderate inter-tussock space in HZ1. Accordingly, there is limited scope to improve the current quality of Golden Sun Moth habitat further without committing the landowner to achieving unrealistic targets beyond their control, such as increasing long term species stocking rates which are also subject to natural breeding cycles, and climatic and seasonal conditions. The 2021/22 Golden Sun Moth survey period for example, saw fewer Golden Sun Moths recorded across Victoria, most likely due to the cooler and wetter conditions experienced under La Nina affect, which was beyond control of land managers.

Given the significant threats to remaining native grassland habitats in Victoria from the intensification and expansion of agricultural production and urban development, (CES 2018) the protection and

maintenance of remaining native grassland habitats for the Golden Sun Moth is of significant value to the persistence of the species throughout the state. Hence, the protection and maintenance of Golden Sun Moth habitat across 128 hectares is proposed to compensate for impacts to Golden Sun Moth habitat from the WORM Project.

The projected decline in Golden Sun Moth habitat quality without the offset from 7/10 to 6/10 in HZ1 and from 6/10 to 5/10 in HZ2 assumes that the continuation of historic grazing practices will degrade the quality of habitat (impacting 'site condition' score), through over-grazing native flora in dry and low-growth periods and under-grazing wet and high-growth periods, and will increase the risk of soil disturbance, and fertilizer and broad-acre herbicide use. These practices have been shown to increase introduced biomass, thereby limiting inter-tussock space for Golden Sun Moth breeding and reducing the extent and diversity of native grassland species, in particular Wallaby-grasses upon which the persistence of Golden Sun Moth populations depend (Tumble and Fraser 1932; O'Dwyer and Attiwill 1999; Dorrough et al 2004).

The projected quality of Golden Sun Moth habitat will be maintained at 7/10 in HZ1 and 6/10 in HZ2, through ensuring adequate inter-tussock space (20-40%) is provided by the commencement to the Golden Sun Moth breeding season (typically October to January), and maintaining or reducing the current weed cover in HZ1 (40-45%) and HZ2 (50-60%). Ongoing Golden Sun Moth population and habitat monitoring will be undertaken throughout the offset management period.

Table 11. Assessed and future projected Golden Sun Moth habitat quality with and without the proposed offset (Appendix 2; Biosis 2020a).

Golden Sun Moth Habitat Quality Assessment		HZ1			HZ2		
		Assessed Habitat Quality	Projected Quality without Offset Assessed	Projected Quality with Offset	Assessed Habitat Quality	Projected Quality without Offset Assessed	Projected Quality with Offset
	Max						
Site condition	3	3	2	3	2	1	2
Site context	3	2	2	2	2	2	2
Species stocking rate	4	2	2	2	2	2	2
Habitat Quality out of 10	10	7	6	7	6	5	6
Golden Sun Moth Offset Area (ha)		108.06	108.06	108.06	19.94	19.94	19.94

Gains in Striped Legless Lizard habitat (HZ1 and HZ2)

To compensate for impacts to 39.92 hectares of Striped Legless Lizard habitat, 153 hectares (108.06 hectares of HZ1 and 44.94 hectares of HZ2) will undergo conservation management in accordance with this OMP to avoid future decline in the extent and quality of Striped Legless Lizard habitat, and to improve its current habitat quality over the 10-year offset management period. Table 11 outlines the assessed habitat quality of the proposed Striped Legless Lizard offset area, the projected decline in quality in 10 years without the offset, and the projected improvement in 10-years with the offset.

The projected decline in quality without the offset from 9/10 to 8/10 in HZ1 and 8/10 to 7/10 in HZ2 assumes that the continuation of historic grazing practices (including year-round set-stocking) will degrade the quality of habitat (impacting 'site condition' score), through over-grazing native flora in dry

and low-growth periods and under-grazing wet and high-growth periods, and will increase the risk of fertilizer and broad-acre herbicide use. These practices promote the spread of introduced annual grasses and herbaceous weeds, and reduce the structural complexity of native grassland habitat for the Striped Legless Lizard (Tumble and Fraser 1932; Dorrrough et al 2004 & 2008a; TSSC 2016).

The projected improvement in quality from 9/10 to 10/10 in HZ1 and 8/10 to 9/10 in HZ2 assumes that the offset site will be managed for the purposes of conservation and will be maintained in perpetuity. It will be achieved through maintaining the current 'site condition' and 'species stocking rate', and improving the 'site context' score by removing all threats that currently may impact upon Striped Legless Lizard, including uncontrolled, continuous grazing by sheep (Table 12; Appendix 3). The projected habitat quality with the offset has been determined based on the offset management actions proposed to be implemented over the 10-year management period (section 4.2). These will include restricting livestock and vehicle access, and undertaking biomass, weed and pest control to maintain or reduce the current weed cover (40-45% in HZ1, 50-60% in HZ2) and pressure on the existing Striped Legless Lizard population. Ongoing Striped Legless Lizard population and habitat monitoring will be undertaken throughout the offset management period.

Table 12. Assessed and future projected Striped Legless Lizard habitat quality, with and without the offset (Appendix 3; APA 2022).

Striped Legless Lizard Habitat Quality Assessment		HZ1			HZ2		
		Assessed Quality	Projected Quality without Offset	Projected Quality with Offset	Assessed Quality	Projected Quality without Offset	Projected Quality with Offset
	Max						
Site condition	3	3	2	3	2	1	2
Site context	4	3	3	4	3	3	4
Species stocking rate	3	3	3	3	3	3	3
Habitat Quality out of 10	10	9	8	10	8	7	9
Striped Legless Lizard Offset Area (ha)		108.06	108.06	108.06	44.94	44.94	44.94

Objective 3: Implement the 10-year offset management plan

A 10-year offset management plan (OMP) has been prepared in consultation with the land manager and Trust for Nature, and drawn from peer-reviewed literature and expertise in grassland habitat management. The management activities, schedule and performance targets for the 10-year management period are outlined below. The implementation of this OMP is essential to achieve the projected gain in Striped Legless Lizard habitat.

Objective 4: Undertake an adaptive management approach

Native grasslands are dynamic and inherently variable ecosystems, where vegetation and habitat composition can change yearly and seasonally in response to rainfall, temperature, fire, grazing pressure and management (Langford 2005). The composition and cover of native flora naturally fluctuates seasonally with their growth cycles, and without native canopy protection, grassland vegetation and habitats are particularly vulnerable to short- and medium-term weed invasions and climatic extremes.

Managers of native grassland habitats must be highly responsive to seasonal variability, changes in site conditions and the emergence of new threats, and have sufficient flexibility to adapt their management appropriately.

An adaptive management approach involves continual monitoring, review and re-evaluation of management strategies to achieve the management objectives. Undertaking an adaptive management approach is essential to the success of this offset, as it will ensure that the land manager has adequate flexibility to adjust their management approach according to the outcomes of implemented management activities and/or unforeseen threats that may arise, and to respond to seasonal variations, in particular fluctuations in annual grassy and herbaceous weeds.

An adaptive management approach may involve adjustments in the timing and methods of the management activities outlined in section 4.2 below. It may also involve the introduction of alternative management activities that are not outlined below, but which also align with the objectives of the offset management plan. To ensure accountability under an adaptive management approach, any changes to the management actions outlined below, or the introduction of new activities and approaches beyond the scope of the proposed offset management actions in Section 4.2 must be undertaken in consultation with TfN. A variation to the OMP should not be required under an adaptive management approach, unless a variation to the offset objectives is required. Any proposed variation to the OMP will be subject to DCCEE approval.

Under an adaptive management approach, strict management actions and schedules are not possible as they will limit the flexibility of the land manager to adjust management approaches and timing and in response to changing site, seasonal or climatic conditions. Accordingly, restrictive language, such as “must” are not used under the proposed grassland management actions. All targets should be assessed with consideration of the timing of the assessment and normal seasonal variability, and where appropriate, unseasonal conditions and/or recent management. For example, summer rainfall typically results in the rapid germination of herbaceous weeds, particularly Flatweed (see Section 4.2.5.3) and thistles, and grassland vegetation assessments undertaken in winter or following grazing events are less likely to detect the diversity and cover of native flora present.

Regular site monitoring and good record keeping (see Section 4.2.7) will ensure that in the event that performance targets are not met within a particular period, evidence of the climatic and site conditions, and management and remedial actions undertaken will assist to determine ongoing compliance with the approved OMP. Flexibility in the timing of vegetation assessments will also avoid a reliance on average seasonal conditions prevailing in order to meet vegetation condition targets, and allow land managers to effectively respond to unseasonal events without impacting fixed assessment schedules.

4.2 Management Actions

4.2.1 Security Agreement

Prior to the commencement of the offset management plan, the offset will be secured on-title via a Section 173 Agreement with the Colac Otway Shire to provide interim offset site security in lieu of the in-perpetuity

registration of a Trust for Nature (TfN) Deed of Covenant (Offset) for the Conservation of Land. The commencement of the 10-year offset management plan will coincide with the Section 173 Agreement registration on-title.

As the registration of a TfN Covenant generally takes 12-18 months, the interim Section 173 Agreement will avoid a delay in the commencement of the offset and hence the commencement of the WORM Project. The Section 173 Agreement will be administered by the Colac Otway Shire and will restrict allowable land uses in the offset site to the delivery of the approved OMP only. The Section 173 Agreement will apply to the land title until the TfN Deed of Covenant is secured on-title. Once on-title, the TfN Deed of Covenant will permanently restrict allowable land uses to conservation purposes only in accordance with the approved OMP, and exclude agricultural production, development, recreation and any other activities that may remove or disturb native vegetation and habitat, soil and rocks. The Section 173 Agreement will be removed from title once evidence that the TfN Deed of Covenant is secured on-title is provided to the Colac Otway Shire.

4.2.2 Fencing and Access

The property is fenced and stockproof along all property boundaries, and existing internal fencing occurs in between the western [REDACTED] and eastern [REDACTED] portions of the property, and along the boundaries of the two existing offset sites (Figure 2). Sections of the boundary fencing however require upgrading or repair, and barbwire will be removed and replaced to meet TfN fencing standards. New internal fencing will be erected within the offset area to divide the offset site into 5 paddocks to support a rotational grazing regime. This internal fencing will border the offset area in the eastern [REDACTED] portion of the property. The offset boundary in the south-eastern corner in the western [REDACTED] portion of the property will not be fenced to avoid creating a paddock that will be too small to support the rotational grazing regime (see Section 4.2.4.1). Instead posts will be erected to mark the boundary of the offset in this section without restricting grazing.

Fencing installation and upgrades will be undertaken as soon as practical within a suitable season (summer to autumn) within 18 months from the commencement of the OMP. This timeframe ensures adequate flexibility for the landowner to avoid impacts to native flora and soils from vehicles (ie. when wet) and accounts for current labour shortages (ie. fencing contractors currently booked up 6 months ahead).

All fencing will be stockproof and will assist in undertaking a controlled strategic grazing regime in the offset site. Gates will be installed to allow vehicle access for offset management and monitoring purposes. Vehicle access tracks have been excluded from the offset. The offset site will not be accessed by heavy vehicles during wet periods (eg. winter) to avoid adverse impacts to native vegetation and soil structure. [REDACTED]. These gates will remain locked to avoid unauthorised access to the property and offset site.

4.2.3 Signage

Within three months from the commencement of the OMP, signage will be erected along the offset boundary fences (includes part of property boundary fence) and at vehicle access gates to alert neighbouring properties

and land managers to the presence of the offset site and prohibited activities. A minimum of four signs will be erected along the property boundary fence and one for each offset site access gate.

4.2.4 Biomass Control

Biomass control is an important management activity to promote floristic diversity in native grassland vegetation and to maintain suitable habitat for the Golden Sun Moth and Striped Legless Lizard. Biomass control aims to maintain the inter-tussock spaces for germination and recruitment of native flora (in particular native herb species), adequate bare ground for Golden Sun Moth habitat and breeding, and structural complexity for Striped Legless Lizard habitat, and will target introduced flora species through timing and regular monitoring (discussed below).

The current cover of bare ground varies from 10-30% in HZ1 and 10-15% in HZ2. Biomass control will aim to maintain 20-40% bare ground or inter-tussock spaces by mid-late spring each year in both HZ1 and HZ2, where achievable in respect to seasonal conditions, for the recruitment of native herbs and grasses, and to coincide with the beginning of the Golden Sun Moth breeding season (October to January). Biomass control may be undertaken through strategic grazing with sheep and ecological burning.

4.2.4.1. Strategic Grazing

Strategic livestock grazing has been recognised as an essential management tool for the conservation of productive grassland ecosystems (Lunt et al 2007; Dorrough et al 2008b). However, a controlled approach must be undertaken to target introduced grasses and herbaceous weeds, promote the recruitment and extent of native species, and provide adequate inter-tussock space and structural diversity for the Golden Sun Moth and Striped Legless Lizard. Through sheep grazing trials undertaken in NTGVVP, Zimmer et al (2010) found that a grazing and rest regime, with a rest in either spring or summer, resulted in a higher cover and diversity of native herbs than a set-stocking or grazing exclusion regime. A rest over both spring and summer however resulted in a slightly reduced cover and diversity of native herbs, most likely due to competition with introduced annual grasses and herbaceous weeds.

Zimmer et al (2010) cautions that the cover and extent of native and non-native species from each grazing trial was site-dependent, and that management decisions need to take into account the existing species composition and seasonal conditions. The offset site comprises a moderate to high cover of annual grasses and herbaceous weeds (40-45% cover in HZ1, 50-60% cover in HZ2). High intensity grazing in early spring is a suggested regime for grasslands with a high cover of annual weeds, to avoid competition with native species recruiting in late spring and summer (Dorrough et al 2008a). However, spring and summer periods with a higher than average rainfall may also require longer periods of grazing.

The offset site will form part of a rotational grazing regime across the entire property. The number of sheep, timing and grazing period for the offset will depend largely on seasonal conditions, and will involve close monitoring by the land manager to determine the appropriate pressure, timing and frequency. Under a strategic grazing regime for this offset (unless a variation is made in consultation with TfN) the land manager will:

- Implement a grazing and rest regime using sheep;
- Allow native grasses sufficient rest and recovery time after each grazing period (ie. until all native grass species have at least three tillers);
- Reduce the grazing pressure from mid to late spring to (eg. <6 DSE/ha) where possible to minimise impacts to native forb species and allow for their natural recruitment;
- Maintain a minimal stocking rate over summer (0-6 DSE/ha depending on seasonal conditions) to support the natural recruitment of native grass species;
- Where possible, aim for a 3-month exclusion period in either spring or summer if seasonal and vegetative conditions allow (eg. if annual introduced grasses and herbaceous weeds are not out-competing native flora); and,
- Reduce or remove grazing from the offset site entirely at any other time as required (eg. during dry, low growth periods, or extreme wet conditions when site may be at risk of excess pugging), to avoid impacts to the native grassland, and Golden Sun Moth and Striped Legless Lizard habitat.

To assist landowner decisions on the most appropriate grazing regime relevant to the vegetation quality, species composition and seasonal conditions each year, a rapid spring survey will be undertaken by a qualified botanist/ecologist in each management year (see Section 4.2.7.2). The survey will identify the flora species present and the composition of these species at the time of assessment, including the extent of native vs non-native and perennial vs annual grasses and herbs. This survey will assist management decisions on biomass and weed control over spring and summer.

4.2.4.2. Ecological Burning

Ecological burning can assist in reducing both native and non-native biomass and, where targeted, the cover of introduced grasses, particularly if undertaken in conjunction with strategic grazing and other weed control (Lunt & Morgan 2002). The timing and intensity of ecological burning should be adjusted according to the flora species being targeted, their growth and flowering periods, and to assist the effectiveness of other weed control.

For example, Yorkshire Fog *Holcus lanatus* is an introduced perennial grass that tolerates wet conditions. If conditions allow, it can be controlled through burning at the beginning of its flowering period (August-December) in winter. Introduced annual grasses generally flower from mid-late spring, accordingly burning should be undertaken in late winter or early spring to control introduced annual grasses prior to their high-growth and seed set period. Where required, dense swards of native Kangaroo Grass *Themeda triandra* can be thinned through either burning in spring to create space for native herb recruitment, or autumn (prior to their dormancy) to reduce their overall density. Ecological burning can also be undertaken to increase the effectiveness of herbicide spraying of introduced perennial grasses. Toowoomba Canary-grass *Phalaris aquatica* can be more effectively sprayed after a burn has removed its large perennial tussock, as a smaller regenerating tussock requires less chemical herbicide to kill.

While burning is an effective management tool in native grasslands, the outcomes of burning can vary and should be used on a 'trial' basis, followed up by regular monitoring and review. For this offset, ecological burning will involve:

- Burning outside the fire danger period (generally April to November);
- Burning within the fire danger period can only be undertaken following approval by TfN and with a permit to burn from the Colac Otway Shire Council;
- Pre- and post-burn monitoring, including photos and observations on biomass, weed and native vegetation covers, and summarised in annual reports (see Section 4.2.7.1);
- Burning in a non-targeted mosaic pattern to a maximum of 30% of the offset site in one year, or burning one or multiple targeted areas (to a maximum of 30% of the offset site in one year) with a high cover of introduced grasses or dense swards of native grass (eg. Kangaroo Grass) that are limiting inter-tussock spaces;
- A minimum of two burns to be undertaken prior to Year 9 of the 10-year offset management period, to allow for adequate review of results in Years 9 and 10;
- The reintroduction of grazing should be delayed post burn to allow sufficient recovery of native perennial grass (eg. native grasses have a minimum of three tillers); and,
- All burning must be undertaken in accordance the Colac Otway Shire and CFA planning requirements.

4.2.5 Weed Control

The offset site does not contain any woody weeds, but the cover of introduced grasses and herbaceous weeds varies from 40-45% in HZ1 and 50-60% in HZ2. Table 13 below lists all the weeds observed on site, their threat status (based on their invasiveness and status under the *Catchment and Land Protection Act 1994*), and the method and timing for their control. The total weed cover will be maintained or reduced over the 10-year offset management period to remove the ongoing threat of introduced flora to the MNES and facilitate the recruitment of native flora species. The cover of high threat weeds will be targeted to minimise their competition with native vegetation.

Weed control methods include strategic grazing (section 4.2.4.1), ecological burning (Section 4.2.4.2), herbicide application (section 4.2.5.1), slashing (ie. prior to seedset) chipping (ie. with hoe) or handpulling. Monitoring for new and emerging woody and herbaceous weeds will be conducted throughout the year, and any new and emerging weeds eliminated.

4.2.5.1 Herbicide Application

The application of herbicides is an effective and efficient control method for a range of woody, herbaceous and grass weeds. Off-target impacts to surrounding native plants must be avoided through the correct use and careful application of herbicides. All herbicides must be used in accordance with the manufacturer's specifications and occupational health and safety policies. Application methods may include spot spraying with a knapsack, dabbing of weeds with a foam tipped application device (ie. weed wand), dabbing/painting of cut stumps and injection of woody weeds.

4.2.5.2 Onion Grass

Onion Grass *Romulea rosea* is a common weed found throughout Victoria. It occurs in the offset site at a low cover (approximately 1%). Control options for Onion Grass are however limited in native grasslands, as there are no selective herbicides that will target Onion Grass without also harming adjacent native species. Corms

may be dug out, but this practice will cause significant ground disturbance for native flora and fauna. If concentrated infestations occur, that do not contain any native flora, herbicide may be applied. If infestations contain native flora, herbicide cannot be applied.

4.2.5.3 Flatweed

‘Flatweed’ or ‘Cat’s Ear’ *Hypochaeris radicata* is a widespread weed in south-eastern Australia, found in both disturbed and undisturbed sites. The Royal Botanic Gardens of Victoria (RBGV) (2024) describe Flatweed as “Probably the most ubiquitous weed in Victoria, occurring even in near-pristine native vegetation”. The species is a perennial herb up to 80cm tall, with a long tap-root, a rosette of lanceolate leaves and bright yellow flowers. It produces large quantities of wind-dispersed seed, which can germinate all year-round in response to favourable (generally wet) conditions. It is not considered a high threat weed of native grasslands, but rather it is opportunistic. Their cover fluctuates in response to seasonal and site conditions, and they are not known to out-compete native vegetation. Recommended control techniques for Flatweed include a combination of spot-spraying, mechanical removal and rotational grazing (HerbiGuide 2022). However, given its widespread distribution and invasiveness, any control of flatweed is unlikely to be effective long term, hence eradication is not considered possible, nor essential to the health of the grassland habitat.

Maintaining or reducing the current weed cover is considered achievable over the 10-year offset management period, with the exception of Flatweed as a potential variable to this target, particularly under favourable (wet) conditions. Any assessment of Flatweed cover should review the species overall trend under average seasonal conditions where possible. Site monitoring and management decisions should factor in the difficulties in effective control of Flatweed, whether the offset is subject to unusually wet conditions, which would favour the species temporarily and cause fluctuations in its cover to occur, and whether a fluctuation in Flatweed is potentially impacting the health of the grassland or not.

Table 13. Weeds recorded in the Offset Site, control method and timing.

Weed Group/ Common Name	Species Scientific Name	Threat Status	Method	Timing
Annual grasses	<i>Avena</i> spp., <i>Bromus</i> spp., <i>Hordeum</i> spp., <i>Lolium</i> spp., <i>Vulpia</i> spp.	Moderate	Strategic grazing, ecological burning and slashing prior to seedset	winter and spring
Perennial grasses	<i>Agrostis capillaris</i> , <i>Holcus</i> <i>lanatus</i> , <i>Anthoxanthum</i> <i>odoratum</i> , <i>Cynodon</i> <i>dactylon</i>	Moderate	Strategic grazing, ecological burning, slashing and herbicide application prior to seedset and/or post- burning.	All year
Needle-grasses	<i>Nassella leucotricha</i> , <i>Nassella neesiana</i> , <i>Nassella trichotoma</i>	High	Herbicide application prior to flowering.	All year
Toowoomba Canary-grass	<i>Phalaris aquatica</i>	High	Strategic grazing, ecological burning, slashing and herbicide application prior to flowering.	All year
Flatweeds	<i>Hypochaeris</i> spp., <i>Plantago</i> spp., <i>Rumex</i> spp., <i>Sonchus</i> spp.	Low	Strategic grazing, if required herbicide application prior to flowering	spring
Capeweed	<i>Arctotheca calendula</i>	Moderate	Herbicide application prior to flowering, or chip if practical (eg. present in low numbers).	spring
Thistles	<i>Cirsium vulgare</i> , <i>Silybum</i> <i>marianum</i>	High	Herbicide application prior to flowering, or chip if practical (eg. present in low numbers).	winter, spring and summer
Herbaceous weeds	<i>Centaurea erythraea</i> , <i>Cucumis myriocarpus</i> , <i>Polygonum aviculare</i> , <i>Trifolium</i> spp.	Low	Strategic grazing, if required, herbicide application prior to flowering to control concentrated areas only, or chip if practical (eg. present in low numbers).	spring
Onion Grass	<i>Romulea</i> spp.	Moderate	If concentrated areas occur that do not comprise any native vegetation, herbicide may be applied.	winter to spring
Bathurst Burr	<i>Xanthium spinosum</i>	Low	Herbicide application prior to flowering, or chip if practical (eg. present in low numbers).	summer to autumn

4.2.6 Pest Control

The *Catchment and Land Protection Act 1994* lists rabbits and foxes as established pest animals and requires that all landowners take reasonable steps to prevent the spread of, and as far as possible, eradicate established pest animals on their land. Rabbits and foxes are a threat to native fauna through competition and predation respectively. Rabbits also impact native grassland vegetation from over-browsing and erosion.

Rabbits and foxes are known to occur in the offset at low numbers (*pers. comm.* Landowner). No warrens or dens have been observed in the offset site. Rabbits and foxes will be monitored and controlled as required in the offset site throughout the year in accordance with Table 14 below. Annual shooting is the preferred control method. Other methods that may be implemented include fumigation, hand collapsing of burrows/dens and baiting if required. Any carcasses must be removed to prevent poisoning of native predators. Rubbish and artificial piles of logs and rocks may be used as harbour by pest animals, and should be removed or dispersed as appropriate. Indigenous plants, fallen logs or rocks will not be removed from the site.

Monitoring for new and emerging pest animals will also be undertaken throughout the year, and control undertaken as required.

Table 14. Pest animals control method and timing.

Common name	Method	Timing
Rabbits & Foxes	Fumigation and hand collapse of rabbit burrows and fox dens, if required	Ongoing
Rabbits & Foxes	Baiting (optional method)	September to January if required
Rabbits & Foxes	When baiting, collect and dispose of carcasses to prevent poisoning of native predators.	September to January if required
Rabbits & Foxes	Shooting	All year
Rabbits & Foxes	Remove or disperse surface harbour	Ongoing
Rabbits & foxes	Monitor and control	Ongoing
New & Emerging pest animals	Monitor and control	Ongoing

4.2.7 Monitoring and Reporting

Within three months from the commencement of the OMP, at least five photopoints will be established (eg. one per paddock) by the Landowner and clearly marked throughout the offset site. Photos will be undertaken at these points, and any other points of interest, annually.

Landowner offset site monitoring will be undertaken by the landowner for the duration of the 10-year offset management plan and in perpetuity, although formal reporting will be undertaken for the duration of the 10-year offset management period only. Site monitoring will include observations of flora and fauna, pest animal activity, and native and non-native vegetation cover, and the outcomes of management activities.

Third party monitoring requirements, including the Rapid spring Survey, Vegetation Quality Assessments, and Golden Sun Moth and Striped Legless Lizard monitoring, will be the responsibility of the APT Management Services Pty Limited.

4.2.7.1 Annual Reporting

The landowner will submit annual reports to Colac Otway Shire (Year 1 only), TfN and DCCEEW over the 10-year offset management period, at the end of each management year. The annual report will outline the offset progress against the management activities and performance targets set out in the OMP, including non-compliance as required, and site observations. Annual Reports will include photos and provide enough detail in the form of written comments and supporting evidence that an assessor can easily determine the completion of, or progress against, the performance targets for each management activity. An annual reporting template is provided in Appendix 4. Trust for Nature will also provide their preferred annual reporting proforma to the Landowner, similar to this template, at the commencement of the offset.

4.2.7.2 Rapid Spring Survey

A rapid spring survey will be undertaken by a qualified botanist/ecologist in each management year to assist landowner decisions on biomass and weed control over spring and prior to the reduction in grazing pressures from mid-spring. The survey will identify flora species present, including high threat and emergent weeds, and assess the composition of these species, including the extent of native vs non-native and perennial vs annual grasses and herbs. APA is responsible for funding all third-party monitoring requirements, including the rapid spring surveys. Rapid spring survey advice will be provided directly to the Landowner following each survey.

4.2.7.3 Vegetation Quality Assessment

To monitor the quality of NTGVVP and habitat for Striped Legless Lizard and Golden Sun Moth in the offset site, vegetation quality assessments will be undertaken by suitably qualified botanists/ecologists in Years 2, 5, 8 and 10. These assessments should include:

- A record of flora species present;
- Review vegetative covers of native and non-native vegetation, including native grasses and herbs, woody and herbaceous weeds, and high threat herbaceous weeds;
- Undertake a Vegetation Quality (Habitat Hectare) Assessment (Appendix 1);
- Reassessment of the vegetation and habitat against the condition thresholds for NTGVVP, and Golden Sun Moth and Striped Legless habitat (Tables 6-8); and,
- Vegetation quality assessment reports to be prepared after each assessment in Years 2, 5, 8 and 10.

Vegetation quality assessments will also be undertaken every 5 years after the 10-year offset management period for the life of the approval, and the last two years of the life of the approval, to confirm the continued presence and quality of NTGVVP, and habitat for Striped Legless Lizard and Golden Sun Moth, for the life of the approval (Table 15).

APA is responsible for funding and coordinating all third-party monitoring requirements, including Vegetation Quality Assessments. Vegetation Quality Assessment reports will be submitted to TfN and DCCEEV upon completion. The timing of report submissions will be subject to the appropriate survey periods and consultant timeframes.

4.2.7.4 Golden Sun Moth Monitoring

Golden Sun Moth population monitoring will be undertaken according to the methodology detailed in *The Significant Impact Guidelines for the Critically Endangered Golden Sun Moth* (*Synemon plana*) (DEWHA 2009), for the purposes of monitoring offset delivery and outcomes. Golden Sun Moth populations are known to vary on spatial and temporal scales depending upon habitat quality. Monitoring is necessary to determine if the distribution and population of Golden Sun Moths persists in the offset site and ensure that the management activities and habitat are suitable for a viable Golden Sun Moth population in the future.

Golden Sun Moth population monitoring will be undertaken by suitably qualified zoologists/ecologists in Year 1 to gather baseline monitoring data, and subsequently undertaken in Years 2, 5, 8 and 10 to monitor the population. Monitoring will involve the following:

- Monitoring will occur during the Golden Sun Moth flight season (late October to early January) over a minimum of two and up to four suitable days in each monitoring year, at approximately weekly intervals. Once presence is established, surveys will focus on determining the relative distribution of the species on the site;
- Monitoring will be undertaken on warm to hot days (above 20 degrees Celsius by 1000 hrs) during the warmest part the day (1000 to 1400 hrs) with clear or mostly cloudless sky and still or relatively still wind conditions during the survey period, and at least two days since rain;

- Monitoring at the offset site will not commence until moths have been seen flying at a nearby reference site, and will be undertaken between 10am and 3pm; unless male moths are still flying after 3pm – surveys can continue until no more males are seen actively flying;
- Monitoring will be conducted using approximately 50-metre wide, parallel transects with two ecologists walking or driving (where appropriate) at <10km/hr the length of the survey site along transects using a hand-held GPS unit, recording every GSM encountered; and,
- Monitoring reports to be prepared after each monitoring program in Years 1, 2, 5, 8 and 10.

Golden Sun Moth population monitoring will also be undertaken every 5 years after the 10-year offset management period for the life of the approval, and the last two years of the life of the approval, to confirm the species continued presence for the life of the approval (Table 15). Species monitoring subsequent to the 10-year offset management period may be undertaken under a minimum survey regime, assuming species presence is confirmed.

APA is responsible for funding and coordinating all third-party monitoring requirements, including Golden Sun Moth monitoring. Golden Sun Moth monitoring reports will be submitted to TfN and DCCEEW upon completion. The timing of report submissions will be subject to the appropriate survey periods and consultant timeframes.

4.2.7.5 *Striped Legless Lizard Monitoring*

Striped Legless Lizard population monitoring will be undertaken by suitably qualified zoologists/ecologists according to the methodology detailed in *Survey guidelines for Australia's threatened reptiles* (SEWPaC 2011b). Striped Legless Lizard monitoring will determine if the distribution and population of Striped Legless Lizard persists in the offset site and ensure that the management activities and habitat are suitable for a viable Striped Legless Lizard population in the future.

Striped Legless Lizard population monitoring will be undertaken by suitably qualified zoologists/ecologists during the appropriate survey period (tile grids laid by June, monitoring from September to December) in each monitoring year. Monitoring will initially be undertaken in Year 1 to gather baseline monitoring data, and subsequently undertaken in Years 2, 5, 8 and 10 to monitor the population. Striped Legless Lizard population monitoring reports will be prepared after each monitoring year and submitted by the approval holder to TfN and DCCEEW.

Striped Legless Lizard population monitoring will also be undertaken every 5 years after the 10-year offset management period for the life of the approval, and the last two years of the life of the approval, to confirm the species continued presence for the life of the approval (Table 15). Species monitoring subsequent to the 10-year offset management period may be undertaken under a minimum survey regime, assuming species presence is confirmed.

APA is responsible for funding and coordinating all third-party monitoring requirements, including Striped Legless Lizard monitoring. Striped Legless Lizard monitoring reports will be submitted to TfN and DCCEEW upon completion. The timing of report submissions will be subject to the appropriate survey periods and consultant timeframes.

Table 15. Offset Monitoring and Reporting Schedule

Monitoring Type	Responsibility	Monitoring Frequency		
		10-Year Offset Management Period	Life of the Approval (24 June 2022 – 30 January 2072)	In-Perpetuity
Annual Monitoring	Landowner	Ongoing	Ongoing	Ongoing
Annual Reporting	Landowner, APA, TfN, DCCEW	End of each year	-	-
Vegetation Quality Assessment	Botanist/Ecologist, APA, TfN, DCCEW	Years 2, 5, 8 and 10	Every 5 years, and in last 2 years	-
Golden Sun Moth Population Monitoring	Zoologist/Ecologist, APA, TfN, DCCEW	Years 1, 2, 5, 8 and 10	Every 5 years, and in last 2 years	-
Striped Legless Lizard Population Monitoring	Zoologist/Ecologist, APA, TfN, DCCEW	Years 1, 2, 5, 8 and 10	Every 5 years, and in last 2 years	-

4.3 10-Year Offset Management Plan

4.3.1 Performance and Completion Criteria

The time until the ecological benefit is projected to be 10 years. Native grasslands are dynamic ecosystems that can respond rapidly to changes in management approaches, in particular grazing pressure, effective burning, pest animal control and weed control. This time period is considered adequate to maintain the current quality of Golden Sun Moth habitat and achieve the required gain in NTGVVP and Striped Legless Lizard habitat. Table 16 below outlines the 10-year performance targets and in which year each target will be achieved. The risk of each target not being achieved has been determined in accordance with the Risk Assessment Framework detailed in Appendix 5.

Table 16. 10-year Performance and Completion Criteria

Ecological Outcome	Management Action	Responsibility	Performance Criteria		Completion Criteria	Year to be Achieved	Risk of Completion Criteria not being achieved	Remedial action if Performance or Completion Criteria not achieved		
								Trigger Value	Detection Monitoring	Remedial Action
To protect and preserve the quality of NTGVVP, and Golden Sun Moth and Striped Legless Lizard habitat, and improve the quality of Striped Legless Lizard habitat.	Security Agreement	Landowner, APA, Colac Otway Shire, Land Use Victoria	1.1	Site secured through appropriate administrative protection to permanently restrict allowable land uses and activities to the conservation of MNES	Section 173 Agreement registered on-title in lieu of Trust for Nature Deed of Covenant (Offset)	Commencement of Year 1	Very Low	Section 173 Agreement not executed by all relevant parties, and/or registered on land title	APA, Colac Otway Shire and Landowner currently coordinating execution and registration.	Offset does not proceed prior to execution of Section 173 Agreement. Registration on-title to immediately follow subject to Colac Otway Shire and Land Use Victoria timeframes. Urgency communicated to all stakeholders.
		Landowner, APA, Trust for Nature, Land Use Victoria	1.2		Trust for Nature Deed of Covenant (Offset) registered on-title	ETA during Year 1, subject to agency timeframes	Very Low	TfN Deed of Covenant not executed by all relevant parties, and/or registered on land title within 12 months of the OMP commencement.	APA, TfN and Landowner currently progressing TfN Deed of Covenant execution and registration.	Urgency communicated to Trust for Nature. Any delay in TfN Deed of Covenant (Offset) registration will not impact upon offset management or security, as Section 173 Agreement to remain on-title until TfN Deed is registered. TfN Deed to remain on-title in perpetuity or re-registered if removed.
	Fencing and Access	Landowner	2.1	New offset perimeter fencing installed (part southern and eastern boundaries) and maintained	Offset site is stockproof	As soon as practical within 18 months of commence of OMP (subject to site conditions)	Low	New offset perimeter fencing not installed and/or maintained	Regular site monitoring (ie. 3-monthly)	Install, upgrade and/or repair all fencing and gates as required to prevent access from unauthorised vehicles and neighbouring livestock, and continue rotational grazing regime
			2.2	Existing perimeter fencing upgraded as required and maintained				Existing perimeter fencing not upgraded as		

								required and/or maintained		
			2.3	Internal fences installed and maintained	Offset site supports rotational grazing regime		Low	Internal fences not installed and/or maintained		
			2.4	Property access gates remain locked	Vehicle access is restricted	Commencement of Year 1, ongoing	Low	Property access gates are unlocked	Regular site monitoring (ie. 3-monthly)	
	Signage	Landowner	3.1	Minimum of four signs erected and maintained along boundary fences and at each vehicle access gates	Public alerted to the presence of offset site and prohibited activities	Within 3 months of the commencement of Year 1	Very Low	At least four signs are not visible along boundary fence or access gates.	Regular site monitoring (ie. 3-monthly)	Erect, upgrade, replace and/or maintain signs to alert public as required
	Biomass Control	Landowner	4.1	Strategic sheep grazing undertaken annually in accordance with Section 4.2.4.1	Maintain 20-40% bare ground for native recruitment and Golden Sun Moth and Striped Legless Lizard habitat	Annually	Low	<20% or >40% bare ground during spring each year	Regular site monitoring (ie. 3-monthly) Annual rapid spring survey	Adjust strategic grazing, burning and/or weed control regime to achieve the inter-tussock space and maximum weed covers required (see Sections 4.2.4 and 4.2.5 for methods and timing). Consult with TfN if alternative methods or timing are required.
			4.2	Minimum of two ecological burns prior to Year 9 in accordance with Section 4.2.4.2		Year 8		First ecological burn not undertaken by end Years 5-7. Second ecological burn not undertaken by end Year 8	Annual monitoring and reporting, and review of future management actions	
	Weed Control	Landowner	5.1	Weed control undertaken annually in accordance with Table 13	Habitat Zone 1: Introduced flora <45% cover	Year 10	Low	Habitat Zone 1: Introduced flora >45% cover	Regular site monitoring (ie. 3-monthly)	Supplementary control of introduced grasses and herbaceous weeds in accordance with Table 13. Consult with TfN if alternative methods or timing are required.
					Habitat Zone 2: Introduced flora <60%	Year 10	Low	Habitat Zone 2: Introduced flora >60%	Annual rapid spring survey Vegetation Quality Assessment in Years 2, 5, 8 and 10	
			5.2	Monitoring to be conducted throughout the year, woody, new and	No woody weeds present	Annually	Low	Woody weeds recorded on site		Monitor and control all new and emergent woody and high threat weeds.
					No new and emergent weeds	Annually	Low	New and emergent weeds recorded		

				emergent weeds eliminated (<1%)						
	Pest Control	Landowner	6.1	Rabbit and fox control undertaken annually in accordance with Table 14	Rabbit and fox populations controlled or reduced	Years 1-10	Low	Observed rabbit and fox population increasing	Regular site monitoring (ie. 3-monthly) Annual pest control monitoring	Monitor and control pest animals (see Section 4.2.6 for control methods and timing)
			6.2	New warren, dens and harbour are collapsed, fumigation and removed as required	No active rabbit warrens and fox dens	Year 10	Moderate	Rabbit warrens and/or fox dens detected	Warrens/dens re-monitored two weeks after fumigation/collapse, then monthly for four months. If no further activity, regular site monitoring (ie. 3-monthly) to continue.	
			6.3	New and emergent pests controlled annually on identification of threat	No new and emergent pest animals	Years 1-10	Low	New and emergent pest animals detected		
	Monitoring and Reporting	Landowner	7.1	Install and maintain photopoints	Minimum five photopoints installed and maintained	Commencement of Year 1 to Year 10	Very Low	Less than five photopoints installed and/or maintained	Regular site monitoring (ie. 3-monthly)	Install, upgrade and/or repair at least 5 photopoints as required.
		Landowner	7.2	Regular site monitoring undertaken. Observations, management and photos recorded	Offset management undertaken in accordance with OMP	Every 3 months	Low	Regular site monitoring not undertaken	Regular site monitoring (ie. 3-monthly)	Undertake site monitoring at least every 3 months, and keep a record or observations, management actions and photos.
		Landowner, APA, Colac Otway Shire, Trust for Nature, DCCEEW	7.3	Prepare and Submit Annual Reports	Year 1 monitoring report prepared and submitted to Colac Otway Shire and DCCEEW	End Year 1	Very Low	Year 1 monitoring report not submitted to Colac Otway Shire and DCCEEW	End Year 1	Prepare and submit Year 1 monitoring report to Colac Otway Shire
					Annual report prepared and submitted to Trust for Nature and DCCEEW	End Years 1-10	Very Low	Annual reports not submitted to TfN and DCCEEW	End Years 1-10	Prepare and submit annual reports monitoring reports Trust for Nature and DCCEEW
		Qualified botanist/	7.4	Rapid spring survey undertaken annually	20-40% bare ground by late spring/ early summer for	spring each year	Low	<20% or >40% bare ground		Coordinate rapid spring survey with suitably

		ecologist, APA (to fund), Landowner (to coordinate)		for biomass and weed control support.	native recruitment and Golden Sun Moth and Striped Legless Lizard habitat where possible.			during spring each year	Regular site monitoring (ie. 3-monthly)	qualified personnel each spring, and adjust biomass and weed management according to site and seasonal conditions. See Sections 4.2.4 and 4.2.5 for methods and timing. Consult with TfN if alternative methods or timing are required.
					Habitat Zone 1: Introduced flora <45% cover	Year 10	Low	Habitat Zone 1: Introduced flora >45% cover	Annual rapid spring survey	
					Habitat Zone 2: Introduced flora <60%	Year 10	Low	Habitat Zone 2: Introduced flora >60%	Vegetation Quality Assessment in Years 2, 5, 8 and 10	
		Qualified botanist/ ecologist	7.5	Vegetation Quality Assessment (VQA) undertaken	VQA report prepared and submitted to Landowner, APA, Trust for Nature and DCCEEW	Years 2, 5, 8 and 10	Low	VQA report not submitted to Landowner, APA, Trust for Nature and DCCEEW	End of Years 2, 5, 8 and 10	Coordinate VQA with suitably qualified personnel, and submit VQA report to all stakeholders.
					Total extent and quality of NTGVVP, and habitat for Golden Sun Moth and Striped Legless Lizard maintained	Year 10	Moderate	Extent and/or quality of NTGVVP, and habitat for Golden Sun Moth and Striped Legless Lizard declines	Regular site monitoring (ie. 3-monthly)	Undertake all management actions in accordance with the OMP and/or adjust management where required, to meet ongoing performance and completion criteria. Consult with TfN if alternative management actions are required that are not addressed in the OMP. Consult with all stakeholders if management approach is not meeting performance and completion criteria, and review OMP as required.
					Quality of Striped Legless Lizard habitat improved to 10/10 in HZ1 and 9/10 in HZ2 and maintained.			Quality of Striped Legless Lizard habitat does not improve	Annual rapid spring survey	
									Vegetation Quality Assessment in Years 2, 5, 8 and 10	
									Golden Sun Moth population monitoring Years 1, 2, 5, 8 and 10	
									Striped Legless Lizard population monitoring Years 1, 2, 5, 8 and 10	
		Qualified zoologist/ ecologist, Landowner, APA, Trust for	7.6	Golden Sun Moth population monitoring undertaken	Golden Sun Moth monitoring reports prepared and submitted to Landowner, APA, Trust for Nature and DCCEEW	Years 1, 2, 5, 8 and 10	Low	Golden Sun Moth monitoring reports not submitted to Landowner, APA, Trust for Nature and DCCEEW	End Years 1, 2, 5, 8 and 10	Coordinate Golden Sun Moth monitoring with suitably qualified personnel and submit report to all stakeholders.

		Nature and DCCEW			Golden Sun Moth distribution and population maintained or improved	Year 10	Low	Golden Sun Moth distribution and population decline evident over multiple monitoring events under favourable survey and species conditions	Regular site monitoring (ie. 3-monthly) Annual rapid spring survey Vegetation Quality Assessment in Years 2, 5, 8 and 10 Golden Sun Moth population monitoring Years 1, 2, 5, 8 and 10	Undertake all management actions in accordance with the OMP and/or adjust management where required, to meet ongoing performance and completion criteria. Consult with TfN if alternative management actions are required that are not addressed in the OMP. Consult with all stakeholders if management approach is not meeting performance and completion criteria, and review OMP as required.
					Quality of Golden Sun Moth habitat maintained	Year 10	Low	Quality of Golden Sun Moth habitat declines		
		Qualified zoologist/ ecologist, Landowner, APA, Trust for Nature and DCCEW	7.7	Striped Legless Lizard population monitoring undertaken	Striped Legless Lizard monitoring reports prepared and submitted to Landowner, APA, Trust for Nature and DCCEW	Years 1, 2, 5, 8 and 10	Low	Striped Legless Lizard monitoring reports not submitted to Landowner, APA, Trust for Nature and DCCEW	End Years 1, 2, 5, 8 and 10	Coordinate Striped Legless Lizard monitoring with suitably qualified personnel and submit report to all stakeholders.
					Striped Legless Lizard distribution and population maintained or improved	Year 10	Low	Striped Legless Lizard distribution and population decline evident over multiple monitoring events under favourable survey and species conditions	Regular site monitoring (ie. 3-monthly) Annual rapid spring survey Vegetation Quality Assessment in Years 2, 5, 8 and 10 Striped Legless Lizard population monitoring Years 1, 2, 5, 8 and 10	Undertake all management actions in accordance with the OMP and/or adjust management where required, to meet ongoing performance and completion criteria. Consult with TfN if alternative management actions are required that are not addressed in the OMP. Consult with all stakeholders if management approach is not meeting performance and
					Quality of Striped Legless Lizard habitat improved to 10/10 in HZ1 and 9/10 in HZ2 and maintained.	Year 10	Low	Quality of Striped Legless Lizard habitat does not improve, and/or declines		

										completion criteria, and review OMP as required.
--	--	--	--	--	--	--	--	--	--	--

4.3.2 10-Year Schedule of Works

Table 17 below summarises the management actions, responsible personnel and timing of each action to be implemented over the 10-year management period.

Table 17. 10-year management actions, responsibility and timing.

Year	Action No.	Management Action	Description	Responsible Authority/ personnel		Timing of action	Performance Target (Table 15)
				Implementation	Payment		
1	1.1	Security Agreement	Offset secured on-title under Section 173 Agreement (to be removed following registration of a Trust for Nature Deed of Covenant)	Landowner, APA, Colac Otway Shire	APA	Commencement of OMP	1.1
1	1.2	Security Agreement	Offset site secured on-title under a Trust for Nature Deed of Covenant.	Trust for Nature, Landowner, APA	APA	Year 1, subject to TfN timeframes	1.2
1	1.3	Monitoring and Reporting	Install a minimum of 5 x photopoints.	Landowner	Landowner	Commencement of OMP	7.1
1	1.4	Fencing and Access	Install stockproof fence along the southern boundary of the eastern offset area (approx. 670m)	Landowner, qualified personnel	APA	Within 18 months of commence of OMP	2.1
1	1.5	Fencing and Access	Upgrade all existing perimeter fencing (approx. 4.5km) as required.	Landowner, qualified personnel	Landowner	Within 18 months of commence of OMP	2.2
1	1.6	Fencing and Access	Install internal fencing to support rotational grazing regime (approx. 2.5km)	Landowner, qualified personnel	APA	Within 18 months of commence of OMP	2.3
1	1.7	Fencing and Access	Property access gates to remain locked at all times	Landowner	Landowner	Commencement of OMP, ongoing	2.4
1	1.8	Signage	Erect a minimum 4 x signs along the property fence and at each vehicle access gates to alert neighbouring properties and land managers to the presence of the offset site and prohibited activities.	Landowner, qualified personnel	Landowner	Within 3 months of commence of OMP	3.1
1	1.9	Biomass Control	Undertake biomass control through strategic grazing with sheep (see Section 4.2.4.1)	Landowner, qualified personnel	Landowner	All year	4.1
1	1.10	Biomass Control	Undertake biomass control through ecological burning as appropriate, monitor and review outcomes (see Section 4.2.4.2)	Landowner, qualified personnel	Landowner	Site conditions and weather dependent	4.2
1	1.11	Weed Control	Undertake appropriate weed control (see Table 13 for control methods and timing).	Landowner, qualified personnel	Landowner	All year	5.1
1	1.12	Weed Control	Monitor for and eliminate woody, new and emergent weeds	Landowner	Landowner	All year	5.2
1	1.13	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 14 for control methods and timing).	Landowner, qualified personnel	Landowner	All year	6.1, 6.2, 6.3
1	1.14	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and a record of management actions and observations. Review future management actions to ensure performance targets are met.	Landowner	Landowner	Every 3 months	7.2
1	1.15	Monitoring and Reporting	Undertake rapid spring survey (in liaison with Landowner) and provide biomass and weeds control support to Landowner	Qualified botanist/ecologist	APA	September-November	7.4

Year	Action No.	Management Action	Description	Responsible Authority/ personnel		Timing of action	Performance Target (Table 15)
				Implementation	Payment		
1	1.16	Monitoring and Reporting	Conduct Golden Sun Moth baseline population monitoring, and submit monitoring report to Landowner, APA, Colac Otway Shire, TfN and DCCEEW.	Qualified zoologist/ecologist	APA	October to January	7.6
1	1.17	Monitoring and Reporting	Conduct Striped Legless Lizard baseline population monitoring, and submit monitoring report to Landowner, APA, Colac Otway Shire, TfN and DCCEEW.	Qualified zoologist/ecologist	APA	June to October	7.7
1	1.18	Monitoring and Reporting	Prepare and submit annual report	Landowner, Colac Otway Shire, Trust for Nature, DCCEEW, APA	Landowner	End of Year 1	7.3
2	2.1	Fencing and Access	Maintain/repair all offset perimeter and internal fencing (approx. 7.67km) as required.	Landowner, qualified personnel	Landowner	All year	2.1, 2.2, 2.3
2	2.2	Fencing and Access	Property access gates to remain locked at all times	Landowner	Landowner	All year	2.4
2	2.3	Signage	Maintain signage along the property boundary and at access gates	Landowner, qualified personnel	Landowner	All year	3.1
2	2.4	Biomass Control	Undertake biomass control through strategic grazing with sheep (see Section 4.2.4.1)	Landowner, qualified personnel	Landowner	All year	4.1
2	2.5	Biomass Control	Undertake biomass control through ecological burning as appropriate, monitor and review outcomes (see Section 4.2.4.2)	Landowner, qualified personnel	Landowner	Site conditions and weather dependent	4.2
2	2.6	Weed Control	Undertake appropriate weed control (see Table 13 for control methods and timing).	Landowner, qualified personnel	Landowner	All year	5.1
2	2.7	Weed Control	Monitor for and eliminate woody, new and emergent weeds	Landowner	Landowner	All year	5.2
2	2.8	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 14 for control methods and timing)	Landowner, qualified personnel	Landowner	All year	6.1, 6.2, 6.3
2	2.9	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and a record of management actions and observations. Review future management actions to ensure performance targets are met.	Landowner	Landowner	Every 3 months	7.2
2	2.10	Monitoring and Reporting	Undertake rapid spring survey (in liaison with Landowner) and provide biomass and weeds control support to Landowner	Qualified botanist/ecologist	APA	September-November	7.4
2	2.11	Monitoring and Reporting	Conduct Vegetation Quality Assessment (see Section 4.2.7.3), and submit report to Landowner, APA, TfN and DCCEEW.	Qualified botanist/ecologist	APA	Year 2	7.5
2	2.12	Monitoring and Reporting	Conduct Golden Sun Moth monitoring, and submit monitoring report to Landowner, APA, TfN and DCCEEW.	Qualified zoologist/ecologist	APA	October to January	7.6

Year	Action No.	Management Action	Description	Responsible Authority/ personnel		Timing of action	Performance Target (Table 15)
				Implementation	Payment		
2	2.13	Monitoring and Reporting	Conduct Striped Legless Lizard monitoring, and submit monitoring report to Landowner, APA, TfN and DCCEEW.	Qualified zoologist/ecologist	APA	June to October	7.7
2	2.14	Monitoring and Reporting	Prepare and submit annual report	Landowner, Trust for Nature, DCCEEW, APA	Landowner	End of Year 2	7.3

3	3.1	Fencing and Access	Maintain/repair all offset perimeter and internal fencing (approx. 7.67km) as required.	Landowner, qualified personnel	Landowner	All year	2.1, 2.2, 2.3
3	3.2	Fencing and Access	Property access gates to remain locked at all times	Landowner	Landowner	All year	2.4
3	3.3	Signage	Maintain signage along the property boundary and at access gates	Landowner, qualified personnel	Landowner	All year	3.1
3	3.4	Biomass Control	Undertake biomass control through strategic grazing with sheep (see Section 4.2.4.1)	Landowner, qualified personnel	Landowner	All year	4.1
3	3.5	Biomass Control	Undertake biomass control through ecological burning as appropriate, monitor and review outcomes (see Section 4.2.4.2)	Landowner, qualified personnel	Landowner	Site conditions and weather dependent	4.2
3	3.6	Weed Control	Undertake appropriate weed control (see Table 13 for control methods and timing).	Landowner, qualified personnel	Landowner	All year	5.1
3	3.7	Weed Control	Monitor for and eliminate woody, new and emergent weeds	Landowner	Landowner	All year	5.2
3	3.8	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 14 for control methods and timing)	Landowner, qualified personnel	Landowner	All year	6.1, 6.2, 6.3
3	3.9	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and a record of management actions and observations. Review future management actions to ensure performance targets are met.	Landowner	Landowner	Every 3 months	7.2
3	3.10	Monitoring and Reporting	Undertake rapid spring survey (in liaison with Landowner) and provide biomass and weeds control support to Landowner	Qualified botanist/ecologist	APA	September-November	7.4
3	3.11	Monitoring and Reporting	Prepare and submit annual report	Landowner, Trust for Nature, DCCEEW, APA	Landowner	End of Year 3	7.3

4	4.1	Fencing and Access	Maintain/repair all offset perimeter and internal fencing (approx. 7.67km) as required.	Landowner, qualified personnel	Landowner	All year	2.1, 2.2, 2.3
4	4.2	Fencing and Access	Property access gates to remain locked at all times	Landowner	Landowner	All year	2.4

Year	Action No.	Management Action	Description	Responsible Authority/ personnel		Timing of action	Performance Target (Table 15)
				Implementation	Payment		
4	4.3	Signage	Maintain signage along the property boundary and at access gates	Landowner, qualified personnel	Landowner	All year	3.1
4	4.4	Biomass Control	Undertake biomass control through strategic grazing with sheep (see Section 4.2.4.1)	Landowner, qualified personnel	Landowner	All year	4.1
4	4.5	Biomass Control	Undertake biomass control through ecological burning as appropriate, monitor and review outcomes (see Section 4.2.4.2)	Landowner, qualified personnel	Landowner	Site conditions and weather dependent	4.2
4	4.6	Weed Control	Undertake appropriate weed control (see Table 13 for control methods and timing).	Landowner, qualified personnel	Landowner	All year	5.1
4	4.7	Weed Control	Monitor for and eliminate woody, new and emergent weeds	Landowner	Landowner	All year	5.2
4	4.8	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 14 for control methods and timing)	Landowner, qualified personnel	Landowner	All year	6.1, 6.2, 6.3
4	4.9	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and a record of management actions and observations. Review future management actions to ensure performance targets are met.	Landowner	Landowner	Every 3 months	7.2
4	4.10	Monitoring and Reporting	Undertake rapid spring survey (in liaison with Landowner) and provide biomass and weeds control support to Landowner	Qualified botanist/ecologist	APA	September-November	7.4
4	4.11	Monitoring and Reporting	Prepare and submit annual report	Landowner, Trust for Nature, DCCEW, APA	Landowner	End of Year 4	7.3

5	5.1	Fencing and Access	Maintain/repair all offset perimeter and internal fencing (approx. 7.67km) as required.	Landowner, qualified personnel	Landowner	All year	2.1, 2.2, 2.3
5	5.2	Fencing and Access	Property access gates to remain locked at all times	Landowner	Landowner	All year	2.4
5	5.3	Signage	Maintain signage along the property boundary and at access gates	Landowner, qualified personnel	Landowner	All year	3.1
5	5.4	Biomass Control	Undertake biomass control through strategic grazing with sheep (see Section 4.2.4.1)	Landowner, qualified personnel	Landowner	All year	4.1
5	5.5	Biomass Control	Undertake biomass control through ecological burning as appropriate, monitor and review outcomes (see Section 4.2.4.2)	Landowner, qualified personnel	Landowner	Site conditions and weather dependent	4.2
5	5.6	Weed Control	Undertake appropriate weed control (see Table 13 for control methods and timing).	Landowner, qualified personnel	Landowner	All year	5.1

Year	Action No.	Management Action	Description	Responsible Authority/ personnel		Timing of action	Performance Target (Table 15)
				Implementation	Payment		
5	5.7	Weed Control	Monitor for and eliminate woody, new and emergent weeds	Landowner	Landowner	All year	5.2
5	5.8	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 14 for control methods and timing)	Landowner, qualified personnel	Landowner	All year	6.1, 6.2, 6.3
5	5.9	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and record of observations. Review future management actions to ensure performance targets are met.	Landowner	Landowner	Every 3 months	7.2
5	5.10	Monitoring and Reporting	Undertake rapid spring survey (in liaison with Landowner) and provide biomass and weeds control support to Landowner	Qualified botanist/ecologist	APA	September-November	7.4
5	5.11	Monitoring and Reporting	Conduct Vegetation Quality Assessment (see Section 4.2.7.3), and submit report to Landowner, APA, TfN and DCCEEW.	Qualified botanist/ecologist	APA	Year 5	7.5
5	5.12	Monitoring and Reporting	Conduct Golden Sun Moth monitoring, and submit monitoring report to Landowner, APA, TfN and DCCEEW.	Qualified zoologist/ecologist	APA	October to January	7.6
5	5.13	Monitoring and Reporting	Conduct Striped Legless Lizard monitoring, and submit monitoring report to Landowner, APA, TfN and DCCEEW.	Qualified zoologist/ecologist	APA	June to October	7.7
5	5.14	Monitoring and Reporting	Prepare and submit annual report	Landowner, Trust for Nature, DCCEEW, APA	Landowner	End of Year 5	7.3
6	6.1	Fencing and Access	Maintain/repair all offset perimeter and internal fencing (approx. 7.67km) as required.	Landowner, qualified personnel	Landowner	All year	2.1, 2.2, 2.3
6	6.2	Fencing and Access	Property access gates to remain locked at all times	Landowner	Landowner	All year	2.4
6	6.3	Signage	Maintain signage along the property boundary and at access gates	Landowner, qualified personnel	Landowner	All year	3.1
6	6.4	Biomass Control	Undertake biomass control through strategic grazing with sheep (see Section 4.2.4.1)	Landowner, qualified personnel	Landowner	All year	4.1
6	6.5	Biomass Control	Undertake biomass control through ecological burning as appropriate, monitor and review outcomes (see Section 4.2.4.2)	Landowner, qualified personnel	Landowner	Site conditions and weather dependent	4.2
6	6.6	Weed Control	Undertake appropriate weed control (see Table 13 for control methods and timing).	Landowner, qualified personnel	Landowner	All year	5.1
6	6.7	Weed Control	Monitor for and eliminate woody, new and emergent weeds	Landowner	Landowner	All year	5.2
6	6.8	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 14 for control methods and timing)	Landowner, qualified personnel	Landowner	All year	6.1, 6.2, 6.3

Year	Action No.	Management Action	Description	Responsible Authority/ personnel		Timing of action	Performance Target (Table 15)
				Implementation	Payment		
6	6.9	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and record of observations. Review future management actions to ensure performance targets are met.	Landowner	Landowner	Every 3 months	7.2
6	6.11	Monitoring and Reporting	Undertake rapid spring survey (in liaison with Landowner) and provide biomass and weeds control support to Landowner	Qualified botanist/ecologist	APA	September-November	7.4
6	6.12	Monitoring and Reporting	Prepare and submit annual report	Landowner, Trust for Nature, DCCEEW, APA	Landowner	End of Year 6	7.3
7	7.1	Fencing and Access	Maintain/repair all offset perimeter and internal fencing (approx. 7.67km) as required.	Landowner, qualified personnel	Landowner	All year	2.1, 2.2, 2.3
7	7.2	Fencing and Access	Property access gates to remain locked at all times	Landowner	Landowner	All year	2.4
7	7.3	Signage	Maintain signage along the property boundary and at access gates	Landowner, qualified personnel	Landowner	All year	3.1
7	7.4	Biomass Control	Undertake biomass control through strategic grazing with sheep (see Section 4.2.4.1)	Landowner, qualified personnel	Landowner	All year	4.1
7	7.5	Biomass Control	Undertake biomass control through ecological burning as appropriate, monitor and review outcomes (see Section 4.2.4.2)	Landowner, qualified personnel	Landowner	Site conditions and weather dependent	4.2
7	7.6	Weed Control	Undertake appropriate weed control (see Table 13 for control methods and timing).	Landowner, qualified personnel	Landowner	All year	5.1
7	7.7	Weed Control	Monitor for and eliminate woody, new and emergent weeds	Landowner	Landowner	All year	5.2
7	7.8	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 14 for control methods and timing)	Landowner, qualified personnel	Landowner	All year	6.1, 6.2, 6.3
7	7.9	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and record of observations. Review future management actions to ensure performance targets are met.	Landowner	Landowner	Every 3 months	7.2
7	7.10	Monitoring and Reporting	Undertake rapid spring survey (in liaison with Landowner) and provide biomass and weeds control support to Landowner	Qualified botanist/ecologist	APA	September-November	7.4
7	7.11	Monitoring and Reporting	Prepare and submit annual report	Landowner, Trust for Nature, DCCEEW, APA	Landowner	End of Year 7	7.3
8	8.1	Fencing and Access	Maintain/repair all offset perimeter and internal fencing (approx. 7.67km) as required.	Landowner, qualified personnel	Landowner	All year	2.1, 2.2, 2.3

Year	Action No.	Management Action	Description	Responsible Authority/ personnel		Timing of action	Performance Target (Table 15)
				Implementation	Payment		
8	8.2	Fencing and Access	Property access gates to remain locked at all times	Landowner	Landowner	All year	2.4
8	8.3	Signage	Maintain signage along the property boundary and at access gates	Landowner, qualified personnel	Landowner	All year	3.1
8	8.4	Biomass Control	Undertake biomass control through strategic grazing with sheep (see Section 4.2.4.1)	Landowner, qualified personnel	Landowner	All year	4.1
8	8.5	Biomass Control	Undertake biomass control through ecological burning as appropriate, monitor and review outcomes (see Section 4.2.4.2)	Landowner, qualified personnel	Landowner	Site conditions and weather dependent	4.2
8	8.6	Weed Control	Undertake appropriate weed control (see Table 13 for control methods and timing).	Landowner, qualified personnel	Landowner	All year	5.1
8	8.7	Weed Control	Monitor for and eliminate woody, new and emergent weeds	Landowner	Landowner	All year	5.2
8	8.8	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 14 for control methods and timing)	Landowner, qualified personnel	Landowner	All year	6.1, 6.2, 6.3
8	8.9	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and record of observations. Review future management actions to ensure performance targets are met.	Landowner	Landowner	Every 3 months	7.2
8	8.10	Monitoring and Reporting	Undertake rapid spring survey (in liaison with Landowner) and provide biomass and weeds control support to Landowner	Qualified botanist/ecologist	APA	September-November	7.4
8	8.11	Monitoring and Reporting	Conduct Vegetation Quality Assessment (see Section 4.2.7.3), and submit report to Landowner, APA, TfN and DCCEEW.	Qualified botanist/ecologist	APA	Year 8	7.5
8	8.12	Monitoring and Reporting	Conduct Golden Sun Moth monitoring, and submit monitoring report to Landowner, APA, TfN and DCCEEW.	Qualified zoologist/ecologist	APA	October to January	7.6
8	8.13	Monitoring and Reporting	Conduct Striped Legless Lizard monitoring, and submit monitoring report to Landowner, APA, TfN and DCCEEW.	Qualified zoologist/ecologist	APA	June to October	7.7
8	8.14	Monitoring and Reporting	Prepare and submit annual report	Landowner, Trust for Nature, DCCEEW, APA	Landowner	End of Year 8	7.3
9	9.1	Fencing and Access	Maintain/repair all offset perimeter and internal fencing (approx. 7.67km) as required.	Landowner, qualified personnel	Landowner	All year	2.1, 2.2, 2.3
9	9.2	Fencing and Access	Property access gates to remain locked at all times	Landowner	Landowner	All year	2.4
9	9.3	Signage	Maintain signage along the property boundary and at access gates	Landowner, qualified personnel	Landowner	All year	3.1

Year	Action No.	Management Action	Description	Responsible Authority/ personnel		Timing of action	Performance Target (Table 15)
				Implementation	Payment		
9	9.4	Biomass Control	Undertake biomass control through strategic grazing with sheep (see Section 4.2.4.1)	Landowner, qualified personnel	Landowner	All year	4.1
9	9.5	Biomass Control	Monitor and review outcomes of ecological burning in Years 1-8 (see Section 4.2.4.2)	Landowner, qualified personnel	Landowner	All year	4.2, 7.2
9	9.6	Weed Control	Undertake appropriate weed control (see Table 13 for control methods and timing).	Landowner, qualified personnel	Landowner	All year	5.1
9	9.7	Weed Control	Monitor for and eliminate woody, new and emergent weeds	Landowner	Landowner	All year	5.2
9	9.8	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 14 for control methods and timing)	Landowner, qualified personnel	Landowner	All year	6.1, 6.2, 6.3
9	9.9	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and record of observations. Review future management actions to ensure performance targets are met.	Landowner	Landowner	Every 3 months	7.2
9	9.10	Monitoring and Reporting	Undertake rapid spring survey (in liaison with Landowner) and provide biomass and weeds control support to Landowner	Qualified botanist/ecologist	APA	September-November	7.4
9	9.11	Monitoring and Reporting	Prepare and submit annual report	Landowner, Trust for Nature, DCCEW, APA	Landowner	End of Year 9	7.3
10	10.1	Fencing and Access	Maintain/repair all offset perimeter and internal fencing (approx. 7.67km) as required.	Landowner, qualified personnel	Landowner	All year	2.1, 2.2, 2.3
10	10.2	Fencing and Access	Property access gates to remain locked at all times	Landowner	Landowner	All year	2.4
10	10.3	Signage	Maintain signage along the property boundary and at access gates	Landowner, qualified personnel	Landowner	All year	3.1
10	10.4	Biomass Control	Undertake biomass control through strategic grazing with sheep (see Section 4.2.4.1)	Landowner, qualified personnel	Landowner	All year	4.1
10	10.5	Biomass Control	Monitor and review outcomes of ecological burning in Years 1-8 (see Section 4.2.4.2)	Landowner, qualified personnel	Landowner	All year	4.2, 7.2
10	10.6	Weed Control	Undertake appropriate weed control (see Table 13 for control methods and timing).	Landowner, qualified personnel	Landowner	All year	5.1
10	10.7	Weed Control	Monitor for and eliminate woody, new and emergent weeds	Landowner	Landowner	All year	5.2
10	10.8	Pest Control	Monitor for pest animals, undertaken control measures as required (see Table 14 for control methods and timing)	Landowner, qualified personnel	Landowner	All year	6.1, 6.2, 6.3

Year	Action No.	Management Action	Description	Responsible Authority/ personnel		Timing of action	Performance Target (Table 15)
				Implementation	Payment		
10	10.9	Monitoring and Reporting	Monitor offset site and outcomes of management actions, including photos and record of observations. Review future management actions to ensure performance targets are met.	Landowner	Landowner	Every 3 months	7.2
10	10.10	Monitoring and Reporting	Undertake rapid spring survey (in liaison with Landowner) and provide biomass and weeds control support to Landowner	Qualified botanist/ecologist	APA	September-November	7.4
10	10.11	Monitoring and Reporting	Conduct Vegetation Quality Assessment (see Section 4.2.7.3), and submit report to Landowner, APA, TfN and DCCEEW.	Qualified botanist/ecologist	APA	Year 10	7.5
10	10.12	Monitoring and Reporting	Conduct Golden Sun Moth monitoring, and submit monitoring report to Landowner, APA, TfN and DCCEEW.	Qualified zoologist/ecologist	APA	October to January	7.6
10	10.13	Monitoring and Reporting	Conduct Striped Legless Lizard monitoring, and submit monitoring report to Landowner, APA, TfN and DCCEEW.	Qualified zoologist/ecologist	APA	June to October	7.7
10	10.14	Monitoring and Reporting	Prepare and submit final report	Landowner, Trust for Nature, DCCEEW, APA	Landowner	End of Year 10	7.3

4.4 In Perpetuity Management

4.4.1. Performance and Completion Criteria

The OMP outlines management actions and targets to be implemented at the offset site to improve the quality of habitat for Striped Legless Lizards over the 10-year management period. At the completion of the 10-year management period, the landowner is required to continue to undertake management to maintain the quality and extent of NTGVVP, and Golden Sun Moth and Striped Legless Lizard habitat, at the offset site. Table 18 below outlines the in perpetuity performance and completion criteria for the offset site.

Table 18. In-perpetuity Performance and Completion Criteria

Ecological Outcome	Management Action	Responsibility	Performance Criteria	Completion Criteria	Risk of Completion Criteria not being met	Remedial action if Performance or Completion Criteria not achieved		
						Trigger Value	Detection Monitoring	Remedial Action
To protect and preserve the maintained or improved quality of NTGVVP and Golden Sun Moth and Striped Legless Lizard habitat.	Security Agreement	Landowner, Trust for Nature	Site secured through appropriate administrative protection to permanently restrict allowable land uses and activities to the conservation of MNES	Trust for Nature Deed of Covenant (Offset) remains registered on-title	Very Low	TfN Deed of Covenant removed from title	APA, TfN and Landowner as executing parties to the Deed	Trust for Nature Deed of Covenant (Offset) to remain on-title or re-registered if removed
	Fencing and Access	Landowner	Property fencing maintained	Offset property is stockproof	Low	Property fencing not maintained and not stockproof	Regular site monitoring (ie. 3-monthly)	Upgrade, replace and/or maintain fencing to prevent access from neighbouring livestock and continue rotational grazing regime
			Internal fencing maintained	Offset site supports rotational grazing regime	Low	Internal fencing not maintained and not stockproof		
			Property access gates remain locked	Vehicle access is restricted	Low	Property access gates unlocked	Regular site monitoring (ie. 3-monthly)	Upgrade, replace and/or maintain gates and locks to prevent access from unauthorised vehicles
	Signage	Landowner	Minimum of four signs maintained along offset boundary fence and at each vehicle access gates	Public alerted to the presence of offset site and prohibited activities	Very Low	At least four signs are not visible along boundary fence or access gates.	Regular site monitoring (ie. 3-monthly)	Upgrade, replace and/or maintain signs to alert public as required
	Biomass Control	Landowner	Strategic sheep grazing undertaken in accordance with Section 4.2.4.1	Maintain 20-40% bare ground for native recruitment and	Low	<20% or >40% bare ground during spring each year	Regular site monitoring (ie. 3-monthly)	Adjust strategic grazing, burning and/or weed control regime to achieve

			Ecological burning undertaken as required in accordance with Section 4.2.4.2	Golden Sun Moth and Striped Legless Lizard habitat				the inter-tussock space and maximum weed covers required (see Sections 4.2.4 and 4.2.5 for methods and timing)
Weed Control	Landowner	Weed control undertaken annually in accordance with Table 13	Habitat Zone 1: Introduced flora <45% cover	Low	Habitat Zone 1: Introduced flora >45% cover	Regular site monitoring (ie. 3-monthly) Vegetation Quality Assessment for the life of the approval	Supplementary control of introduced grasses and herbaceous weeds	
			Habitat Zone 2: Introduced flora <60%		Habitat Zone 2: Introduced flora >60%			
		Monitoring to be conducted throughout the year, woody, and new and emergent high threat weeds eliminated (<1%)	No woody weeds present	Low	Woody weeds recorded on site		Monitor and control all new and emergent woody and high threat weeds	
Pest Control	Landowner	Rabbit and fox control undertaken annually in accordance with Table 14	Rabbit and fox populations controlled or reduced	Low	Observed rabbit and fox population increasing	Regular site monitoring (ie. 3-monthly) Warrens/dens re-monitored two weeks after fumigation/collapse, then monthly for four months. If no further activity, regular site monitoring (ie. 3-monthly) to continue.	Monitor and control pest animals (see Section 4.2.6 for control methods and timing)	
		New warren, dens and harbour are collapsed, fumigation and removed as required	No active rabbit warrens and fox dens	Moderate	Rabbit warrens and/or fox dens detected			
		New and emergent pests controlled annually on identification of threat	No new and emergent pest animals	Low	New and emergent pest animals detected			
Monitoring and Reporting	Landowner, Trust for Nature	Site monitoring undertaken through each year in accordance with the Trust for Nature Deed of Covenant (Offset).	Offset management undertaken in accordance with Trust for Nature Deed of Covenant (Offset).	Low	Regular site monitoring not undertaken	Regular site monitoring (ie. 3-monthly)	Adjust management according to site and seasonal conditions to meet ongoing performance and completion criteria.	
			Total extent of NTGVVP (33ha), and habitat for Golden Sun Moth (128ha) and Striped Legless Lizard (153ha) maintained	Moderate	Extent of NTGVVP, and habitat for Golden Sun Moth and Striped Legless Lizard declines	Regular site monitoring (ie. 3-monthly) Vegetation Quality Assessment for life of approval		
			Quality of NTGVVP maintained at 6/10, or higher.	Low	Quality of NTGVVP <6/10	Golden Sun Moth population monitoring for life of approval		
			Quality of Golden Sun Moth habitat maintained at 7/10 in HZ1 and 6/10 in HZ2, or higher.	Low	Quality of Golden Sun Moth habitat <7/10 in HZ1 and <6/10 in HZ2			

				Quality of Striped Legless Lizard habitat maintained at 10/10 in HZ1 and 9/10 in HZ2, or higher.	Low	Quality of Striped Legless Lizard habitat <10/10 in HZ1 and <9/10 in HZ2	Striped Legless Lizard population monitoring for life of approval	
--	--	--	--	--	-----	--	---	--

5 EPBC Act Environmental Offsets Policy

5.1 Meeting the Principles of the EPBC Act Environmental Offsets Policy

Table 19 below outlines how the proposed offsets meet the principles of the *EPBC Act Environmental Offsets Policy* (SEWPaC 2012).

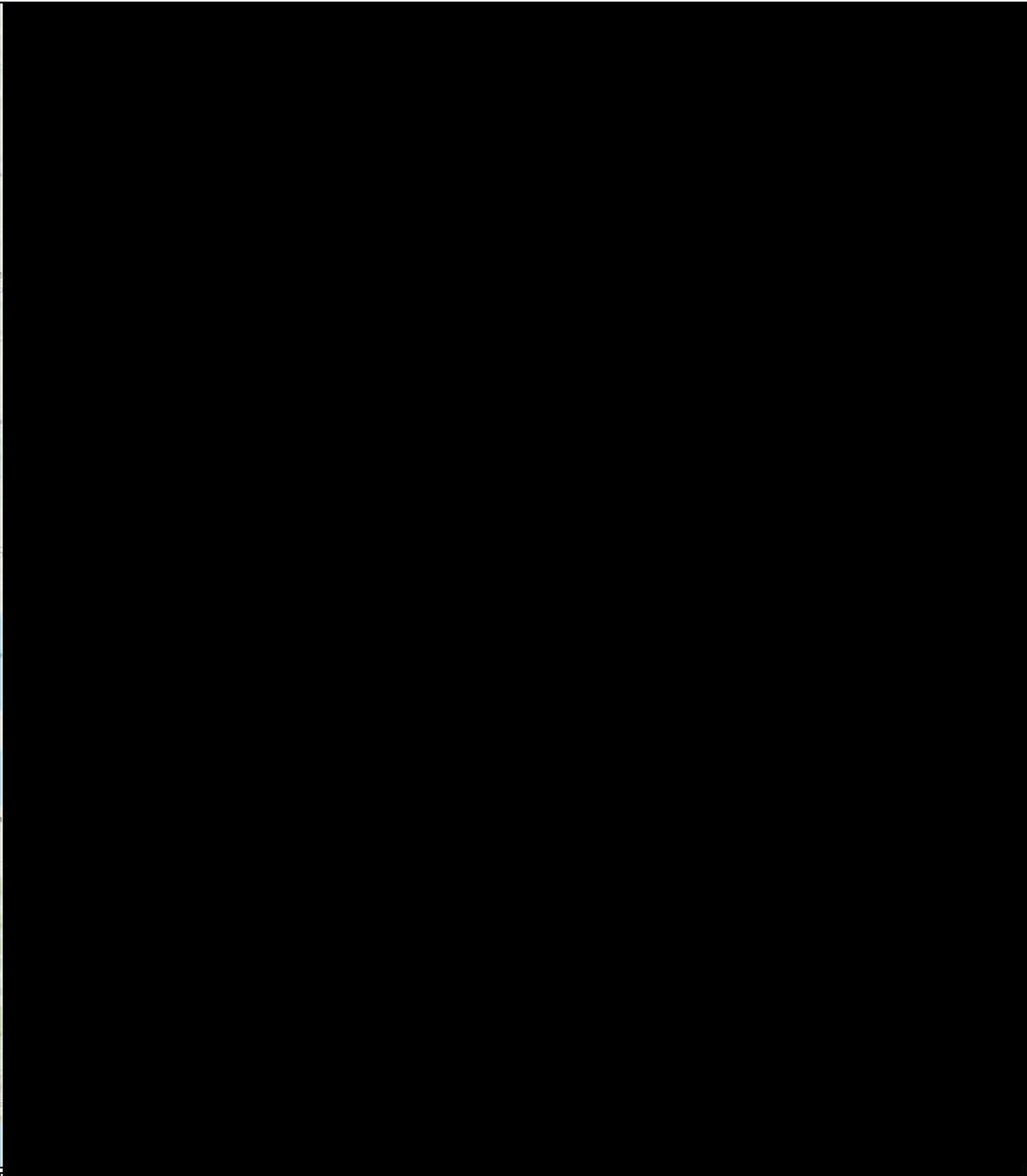
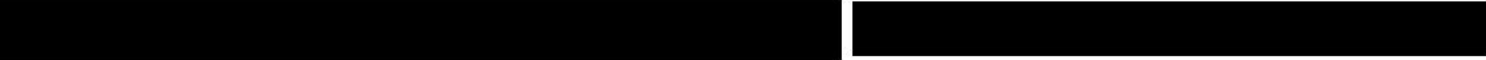
Table 19. Meeting the principles of the *EPBC Act Environmental Offsets Policy*

Principle	Proposed Offset
Deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action.	The offset will maintain and improve the overall viability of NTGVVP, and habitat for the Golden Sun Moth and Striped Legless Lizard, as it will deliver a gain in the protection and improvement of a higher quality vegetation community and habitat area, with a larger population size of Golden Sun Moth and Striped Legless Lizard than that impacted on.
Be built around direct offsets but may include other compensatory measures.	The offset proposal includes at least 100% of direct offsets, that includes in perpetuity protection and management of NTGVVP, and habitat for the Golden Sun Moth and Striped Legless Lizard.
Be in proportion to the level of statutory protection that applies to the protected matter.	The security, extent and management of the offset is in proportion to the protected matter being impacted in accordance with the EPBC Act offsets calculator. The security and management of MNES at the offset under a Section 173 Agreement and subsequent Trust for Nature Deed of Covenant (Offset) will ensure they're permanently protected.
Be of a size and scale proportionate to the residual impacts on the protected matter.	The area of NTGVVP proposed for offset is more than seven times the size of the area being impacted. The area of habitat for the Golden Sun Moth proposed for offset is more than six times the size of the area being impacted. The habitat for Striped Legless Lizard proposed for offset is almost four times the size of the area being impacted..
Effectively account for and manage the risks of the offset not succeeding.	The offset will be secured under a Section 173 Agreement, administered and overseen by the Colac Otway Shire, and subsequently a Trust for Nature Deed of Covenant (Offset), administered and governed by Trust for Nature. The security agreements will be legally binding, and will include the requirement to implement the approved OMP. The offset management has been prepared to deliver improved outcomes for biodiversity and to mitigate against risks of the offset not succeeding (Tables 16 and 18).
Be additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs.	Planning regulations and local laws relevant to the offset allow agricultural activities to continue for the purposes of production, and do not support the permanent protection and improvement of MNES. The security agreements and OMP will provide in perpetuity protection to NTGVVP, and habitat for the Golden Sun Moth and Striped Legless Lizard present, in addition to existing laws and regulations, and ensure that these MNES will be managed for the purposes of conservation in-perpetuity.

Be efficient, effective, timely, transparent, scientifically robust and reasonable.	The impact and offsets have undergone rigorous ecological assessment for MNES (Sections 2.2 and 3.3), and propose valuable protection for all MNES present and gains for NTGVVP and Striped Legless Lizard habitat through a 10-year management plan that draws on literature and research on effective native grassland conservation management and threat abatement.
Have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.	The offset will be delivered in accordance with the approved OMP to be registered on-title via a Section 173 Agreement, and subsequently a Trust for Nature Deed of Covenant (Offset). These are legally enforceable, and are administered and governed by the Colac Otway Shire and Trust for Nature respectively. The Colac Otway Shire will review progress and reporting in Year 1. Trust for Nature will review annual monitoring reports and undertake stewardship visits after Year 1. Monitoring of MNES will also be undertaken and all reports provided to DCCEE.

Figures

FIGURE 1 - LOCATION OF OFFSET SITE



Legend

Proposed Offset Site

Impact Site - Western Outer Ring

Main Project

N

0

5

10

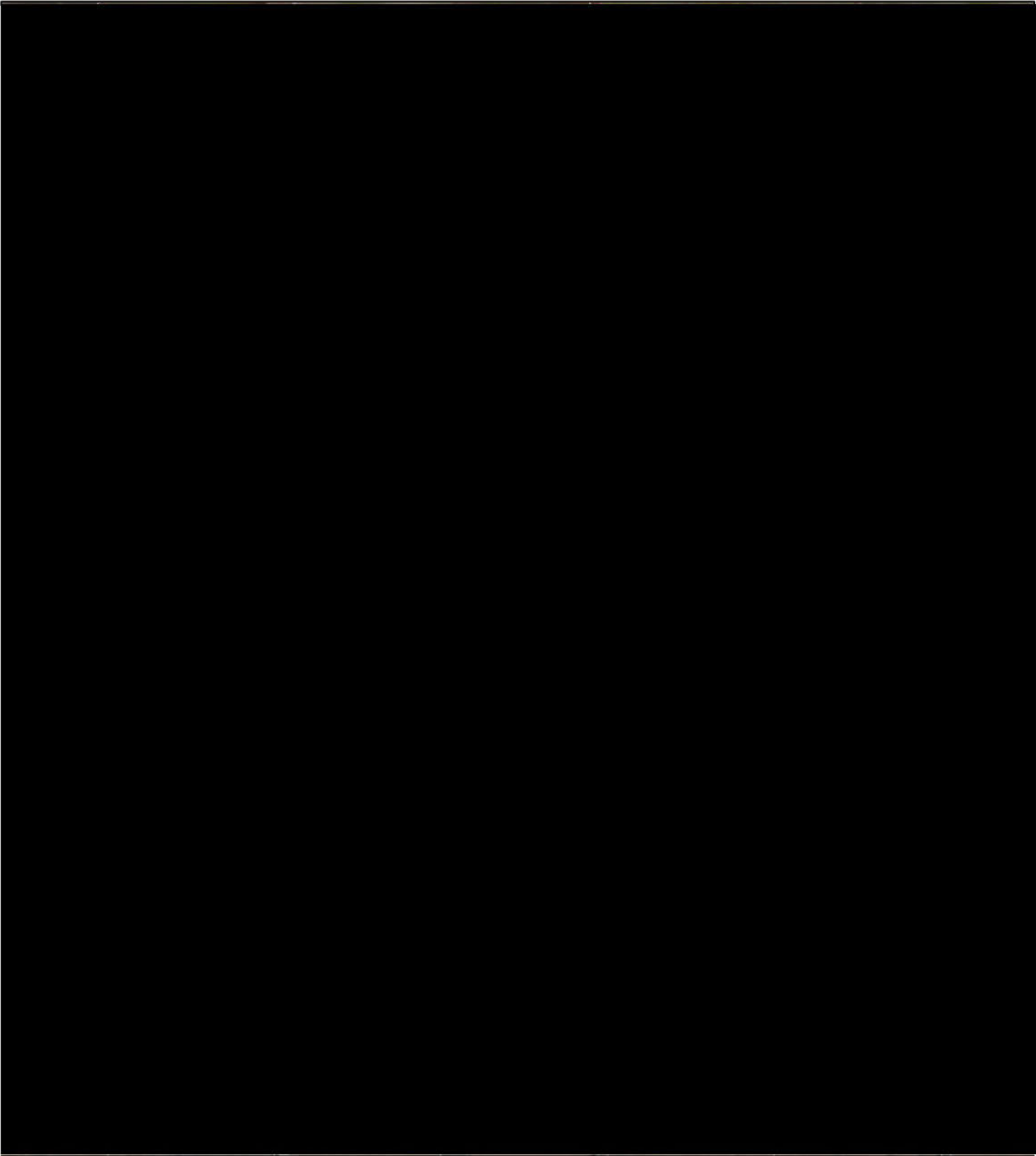
20

30

40

Kilometres

FIGURE 2 - OFFSET ECOLOGICAL FEATURES

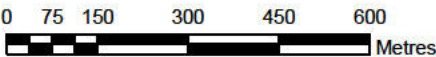


Legend

-  Title Boundary
-  EPBC Act 2019/8569 Grassland Offset (153ha)
-  EPBC 2018/8260 Existing Offset
-  EPBC 2019/8428 Existing Offset

Matters of Environmental Significance

-  HZ1
-  HZ2
-  Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP)
-  Golden Sun Moth (Biosis 2019; SMEC 2019)
-  Striped Legless Lizard (Biosis 2019, EHP 2019)



References

APA (2021) *Western Outer Ring Main Gas Pipeline Inquiry – Technical Note No. 15 – Ecology assessment of Revision 10 alignment changes*, Prepared by APA VTS (Operations) Pty Ltd, Southbank, VIC.

APA (2022) *Western Outer Ring Main Ecological Offset Strategy* (Version April 2022), Prepared by APA VTS (Operations) Pty Ltd, Southbank, VIC.

Biosis (2020a) *Sievers Lane, Glenhope, Victoria: Golden Sun Moth Offset Management Plan (EPBC 2017/8008)*, Report prepared by Biosis Pty Ltd on behalf of Major Road Projects Victoria.

Biosis (2020b) *Victorian Big Battery Storage Facility, 680 Ballan Road Moorabool, Victoria: Preliminary Documentation for EPBC 2020/8614*, Report prepared by Biosis Pty Ltd on behalf of Neoen Australia Pty Ltd.

CES (2018) *Victorian State of the Environment 2018*, 'Biodiversity (B) Scientific Assessments Part III', Commissioner for Environmental Sustainability Victoria.

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

DAWE (2021). *Approved Conservation Advice for Synemon plana (golden sun moth)*. URL: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/25234-conservation-advice-07122021.pdf> (accessed 19/7/2022), Department of Agriculture, Water and the Environment, , Canberra, ACT.

DCCEEW (2022a) *Natural Temperate Grassland of the Victorian Volcanic Plain in Species Profile and Threats Database*. URL: <http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=42> (accessed 19/7/2022), Australian Government Department of Climate Change, Energy, the Environment and Water, Canberra, ACT.

DCCEEW (2022b) *Synemon plana in Species Profile and Threats Database*. URL: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=25234 (accessed 19/7/2022), Australian Government Department of Climate Change, Energy, the Environment and Water, Canberra, ACT.

DCCEEW (2022c) *Delma impar – Striped Legless Lizard in Species Profile and Threats Database*, Available at http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1649 (Accessed 19/7/2022), Australian Government Department of Climate Change, Energy, the Environment and Water, Canberra, ACT.

- DELWP (2022a) *Bioregions and EVC Benchmarks*, URL: <https://www.environment.vic.gov.au/biodiversity/bioregions-and-evc-benchmarks> (accessed 26/7/2022), Victorian Government Department of Environment, Land, Water and Planning, East Melbourne.
- DELWP (2022b) *Victorian Biodiversity Atlas*, URL: <https://vba.dse.vic.gov.au> (accessed 26/7/2022), Victorian Department of Environment, Land, Water and Planning, East Melbourne.
- DoE (2013) *Matters of Environmental Significance: Significance impact Guidelines 1.1, Environmental Protection and Biodiversity Conservation Act 1999*, Australian Government Department of the Environment, Canberra, ACT.
- Dorrough, J., Yen, A., Turner, V., Clark, S., Crosthwaite, J. and J. Hirth (2004) 'Livestock grazing management and biodiversity conservation in Australian temperate grassy landscapes', *Australian Journal of Agricultural Research*, Vol. 55, pp. 279-295.
- Dorrough, J., and M. Scroggie (2008a) 'Plant responses to agricultural intensification', *Journal of Applied Ecology*, Vol. 45, pp. 1274-1283.
- Dorrough, J., Stol, J., and S. McIntyre (2008b) 'Biodiversity in the Paddock: a Land Manager's Guide', CSIRO, Canberra, ACT.
- DSE (2004) *Vegetation Quality Assessment Manual – Guidelines for applying the habitat hectares scoring method Version 1.3*, Victorian Government Department of Sustainability and Environment, East Melbourne.
- DSE (2011) *Salvage and Translocation of Striped Legless Lizard in the Urban Growth Areas of Melbourne: Operational Plan*, Victorian Department of Sustainability and Environment, East Melbourne.
- [REDACTED]
- [REDACTED]
- GHD (2021) *Western Outer Ring Main (WORM) Environment Effects Statement Technical Report A – Biodiversity and Habitats Report*, Unpublished Report prepared by GHD on behalf of APA VTS (Operations) Pty Ltd
- HerbiGuide (2022) 'Flatweed', *HerbiGuide The Pesticide Expert on a Desk*, URL: http://www.herbiguide.com.au/Descriptions/hg_Flatweed.htm (accessed 19/8/2022), HerbiGuide Pty Ltd, Albany, WA.
- Langford, C.M. (2005) 'Managing Native Pasture for Agriculture and Conservation.', In: O'Dwyer, C. and Hamilton, S. (eds) (2005) *Grassland Conservation and Production Both Sides of the Fence*, Proceedings of Fourth Stipa Conference on Management of Native Grasses and Pastures, 11-13 October 2005 Burra, SA. FLFR University of Melbourne, Dookie Campus.

- Lunt, I. & J.W. Morgan (1999) 'Vegetation changes after 10 years of grazing exclusion and intermittent burning in a Themeda triandra (Poaceae) grassland reserve in south-eastern Australia', *Journal of Australian Botany*, Vol. 47, pp. 537-552.
- Lunt, I. & J.W. Morgan (2002) 'The role of fire regimes in temperate lowland grasslands of south-eastern Australia', In: Bradstock R.S., Williams J.E., Gill M.A., eds. *Flammable Australia: the fire regimes and biodiversity of a continent*, Cambridge, UK: Cambridge University Press, 177-196.
- Lunt, I., Eldridge, D., Morgan, J. and G. Witt (2007) 'A framework to predict the effects of livestock grazing and grazing exclusion on conservation values in natural ecosystems in Australia', *Australian Journal of Botany*, Vol. 55, pp. 401-415.
- O'Dwyer, C. and P. Attiwill (1999) 'A comparative study of habitats of the Golden Sun Moth *Synemon plana* Walker (Lepidoptera: Castniidae): implications for restoration', *Biological Conservation*, Vol. 89, pp. 131-141.
- Parkes, D., Newell, G. & D. Cheal (2003) 'Assessing the quality of native vegetation: the 'habitat hectares' approach', *Ecological Management & Restoration*, Vol. 4, S29-S38.
- SEWPaC (2011) *Environment Protection and Biodiversity Conservation Act 1999 referral guidelines for the vulnerable striped legless lizard, Delma impar*, Australian Government Department of Sustainability, Environment, Water, Population and Community, Canberra, ACT.
- SEWPaC (2012) *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy*, Australian Government Department of Sustainability, Environment, Water, Population and Community, Canberra, ACT.
- SEWPaC (2013) *Matters of National Environmental Significance. Significant Impact Guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999*, Australian Government Department of Sustainability, Environment, Water, Population and Community, Canberra, ACT.
- [REDACTED]
- [REDACTED]
- [REDACTED]
- Smith, W.J.S. and P. Robertson (1999) *National Recovery Plan for the Striped Legless Lizard (Delma impar): 1999-2003*, Unpublished report to Environment Australia, Smith WJS and Robertson P, Canberra.
- RBGV (2024) 'Hypochaeris radicata', in *Flora of Victoria*, URL: <https://vicflora.rbhv.vic.gov.au/flora/taxon/caa25649-6aac-4f6a-9685-1eafe5b4e021> (accessed 7/2/2024), Royal Botanic Gardens of Victoria, Melbourne.

Trumble, H. and K. Fraser (1932) 'The effect of top-dressing with artificial fertilisers on the annual yield, botanical composition, and carrying capacity of a natural pasture over a period of seven years', *Journal of Agriculture*, Vol. 35, pp. 1342-1353.

TSSC (2008). *Commonwealth Listing Advice on Natural Temperate Grassland of the Victorian Volcanic Plain*.
URL: <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/42-listing-advice.pdf>
(accessed 19/7/2022). Threatened Species Scientific Committee, Department of the Environment, Water, Heritage and the Arts, Canberra, ACT.

TSSC (2016) *Delmar impar (Striped Legless Lizard) Conservation Advice*, Threatened Species Scientific Committee, Australian Government Department of the Environment and Energy, Canberra, ACT.

Wilson, S. and G. Swan (2010) *A Complete Guide to Reptiles of Australia*, New Holland, Sydney.

Zimmer, H., Turner, V., Mavromihalis, J., Dorrough, J. and C. Moxham (2010) 'Forb responses to grazing and rest management in a critically endangered Australian native grassland ecosystem', *The Rangeland Journal*, Vol. 32, pp. 187–195.

Appendices

Appendix 1. EPBC 2019/8569 Conditions of Approval for Grassland offset

Condition	How condition is addressed	Where condition is addressed in OMP
6. The approval holder must submit to the department for the Minister's approval a Grassland Offset Management Plan (GOMP) for the offset site identified in the approved GOS. The approval holder must ensure that the GOMP, as approved by the Minister in writing, is implemented in accordance with the timelines specified in the GOMP or at least until the expiry of this approval, whichever is the longer. The GOMP must, to the satisfaction of the Minister, meet the requirements of the Environmental Offsets Policy and Environmental Management Plan Guidelines, and must include:	The grassland offset site and OMP meets Environmental Offsets Policy (Section 5) and Environmental Management Guidelines.	This document
a) A summary of the residual impacts to NTGVVP, GSM and SLL that will be compensated for by the offset site. This summary must include the area of habitat for protected matters and the condition at all impact sites which the offset site is to address.	Impacts to 4.52 ha of NTGVVP, 19.93 ha of Golden Sun Moth habitat and 39.92 ha of Striped Legless Lizard habitat is proposed to be compensated by the offset site. Further information is provided in the approved offset strategy (APA 2022).	Section 2.3
b) The relevant protected matters and a reference to the EPBC Act approval conditions to which the GOMP refers.	The relevant protected matters are Natural Temperate Grassland of the Victorian Volcanic Plain, Golden Sun Moth and Striped Legless Lizard. This Offset Management Plan refers to Condition 7 of the EPBC Act approval.	Section 1.1
c) Specific, timebound and measurable ecological benefits for relevant protected matters.	Ecological benefits for each matter are demonstrated through the completion criteria that will be achieved in the 10 year management period. These benefits for each protected matter will be maintained in perpetuity.	Section 4.2, and Tables 16 and 18
d) Measures that will be implemented to achieve the ecological benefits, and a reference to where the commitments are detailed in the GOMP.	All management measures proposed to achieve the ecological benefits are outlined in the OMP and will be given in perpetuity legal protection through the proposed TfN Deed of Covenant.	Section 4.2
e) A table of commitments to achieve the ecological benefits, and a reference to where the commitments are detailed in the GOMP.	All commitments (performance criteria) to control threats and to achieve the completion criteria (ecological benefits) are outlined in the OMP.	Tables 16, 17 and 18
f) The reporting and review mechanisms, and documentation standards that will be implemented to inform others annually	Annual reporting required to be submitted by Landholder to TfN and DCCEEW detailing all monitoring and	Section 4.2.7, Tables 16, 17 and 18, and Appendix 6

regarding compliance with management and environmental commitments, and attainment and maintenance of the ecological benefits as specified in the GOMP.	management undertaken for the offset site. Third party monitoring by qualified ecologists proposed at regular intervals to monitor and review the progress of achieving ecological benefits.	
g) An assessment of risks to achieving the ecological benefits and what risk management strategies will be applied to address these.	Information on risk levels and risk management strategies provided in the OMP.	Tables 16 and 18, and Appendix 5
h) A monitoring program, which must include: I. collecting evidence that effectively determine progress towards, attainment of and maintenance of the ecological benefits for the protected matters	Annual monitoring and reporting to TfN and DCCEEW to be undertaken by Landholder detailing all monitoring and management undertaken over the 10-year offset management period. Third party monitoring by qualified ecologists to be undertaken at regular intervals for the life of the approval to monitor and review the progress of achieving ecological benefits, and the maintenance of benefits once achieved.	Section 4.2.7, and Tables 16 and 18
II. measurable performance indicators to monitor attainment of the ecological benefits for the protected matters	This OMP describes performance criteria and completion criteria which are measurable indicators to meet the required ecological benefits.	Performance and completion criteria in Tables 16 and 18
III. trigger values for corrective actions	This OMP describes trigger values, the monitoring to detect the triggers, and the subsequent corrective (remedial) actions to be undertaken if trigger values are reached.	Tables 16 and 18
IV. the timing and frequency of monitoring capable of detecting trigger values and changes in the performance indicators.	As above.	Section 4.2.7, Tables 16 and 18
i) Proposed corrective actions to ensure ecological benefits for the protected matters are attained or maintained, if trigger values are reached or performance indicators not attained; and	As above.	Remedial actions, Tables 16 and 18
j) Links to referenced plans and applicable conditions of approval (including State approval conditions) if any.	All relevant referencing provided in References or Appendices sections	Section 1 References and Appendices. This OMP links with the WORM Ecological Offset Strategy

Appendix 2. *Treeless* Vegetation Quality Assessment Methodology (DSE 2004)

Treeless Vegetation Quality Field Assessment Sheet

Version 1.4 - July 2009

Department of
Sustainability and
Environment

Site Name/No. Location Date

Assessor(s) Map Name/No. AMG / MGA

Tenure EVC Bioregion

'Site Condition Score'

Understorey Life forms

LF Code from EVC benchmark	# spp observed / Benchmark spp.	% cover observed / Benchmark % cover	Present (✓)	Modified (✓)
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		

Present

For life forms with benchmark cover of < 10%, considered 'present' if

- any specimens are observed.

For life forms with benchmark cover of ≥ 10%, considered 'present' if

- the life form occupies at least 10% of benchmark cover.

Modified

(apply only where life form is 'present')

For life forms with benchmark cover of <10%, then considered substantially 'modified' if the life form has either:

- < 50% of the benchmark species diversity; or
- no reproductively-mature specimens are observed.

For life forms with benchmark cover of ≥ 10%, then considered substantially 'modified' if the life form has either:

- < 50% of benchmark cover; or
- < 50% of benchmark species diversity; or
- ≥ 50% of benchmark cover due largely to immature canopy specimens but the cover of reproductively-mature specimens is < 10% of the benchmark cover.

Lack of Weeds

Score

Category & Description	'high threat' weeds*		
	None	≤ 50%	> 50%
> 50% cover of weeds	4	2	0
25 - 50% cover of weeds	7	6	4
5 - 25% cover of weeds	11	9	7
< 5% cover of weeds**	15	13	11

* proportion of weed cover due to 'high threat' weeds - see EVC benchmark for guide.

'High threat' weed species are defined as those introduced species (including non-indigenous 'natives') with the ability to out-compete and substantially reduce one or more indigenous life forms in the longer term assuming on-going current site characteristics and disturbance regime.

The EVC benchmark lists typical weed species for the EVC in the bioregion and provides an estimate of their 'invasiveness' and 'impact'. In general, those weed species considered to have a *high impact* are considered *high threat* regardless of their invasiveness.

**if total weed cover is negligible (<1%) and high threat weed species are present then score '13'.

Recruitment

Score

Percentage cover of recruitment area*	High native herb diversity*	Low native herb diversity*
0 to 5% cover	0	0
> 5% to 20% cover	6	3
> 20% to 40% cover	10	6
> 40% to 60% cover	6	3
> 60% to 90% cover	3	1
> 90% cover	0	0

* cumulative % cover of bare ground, bryophytes/lichens and soil crust

* high native herb diversity defined as ≥ 50% of benchmark diversity within 'herb' life forms

Understorey

Score

Category & Description	Score
All strata and Life forms effectively absent	0
Up to 50% of life forms present	5
≥ 50% to 90% of Life forms present	10
• of those present, ≥ 50% substantially modified	15
• of those present, < 50% substantially modified	15
≥ 90% of Life forms present	15
• of those present, ≥ 50% substantially modified	15
• of those present, < 50% substantially modified	20
• of those present, none substantially modified	25

Organic Litter

Score

Category & Description	Dominated by native organic litter	Dominated by non-native organic litter
< 10% of benchmark cover	0	0
< 50% or > 150% of benchmark cover	3	2
≥ 50% or ≤ 150% of benchmark cover	5	4

Treeless Vegetation Quality Field Assessment Sheet

Version 1.4 - July 2009

Logs (where applicable*)

Score

Category & Description	Large logs present*	Large logs absent#
< 10% of benchmark length	0	0
< 50% of benchmark length	3	2
≥ 50% of benchmark length	5	4

Large logs defined as those with diameter ≥ 0.5 of benchmark large tree dbh.

+ Applicable to some shrublands and scrubs (refer to EVC benchmark as a guide). Where applicable assess in accordance with the habitat hectares method for logs in treed EVCs. Note that most shrublands and scrubs do not contain a large tree component and hence a large log assessment is not required (refer to EVC benchmark as a guide). Such EVCs should be scored as if 'large logs present'.

* present if large log length is ≥ 25% of EVC benchmark log length.

absent if large log length is < 25% of EVC benchmark log length.

'Landscape Context Score'

Patch Size

Score

Category & Description	
< 2 ha	1
Between 2 and 5 ha	2
Between 5 and 10 ha	4
Between 10 and 20 ha	6
≥ 20 ha, but 'significantly disturbed'*	8
≥ 20 ha, but not 'significantly disturbed'*	10

* 'significantly disturbed' defined as per RFA 'Old Growth' analyses eg. roading, coupes, grazing etc. – effectively most patches within fragmented landscapes.

Neighbourhood

Score

Radius from site	% Native vegetation*	Weighting	
100 m		0.03	
1 km		0.04	
5 km		0.03	
subtract 2 if the neighbourhood is 'significantly disturbed'			
Add Values and 'round-off'			

* to nearest 20%.

Multiply % native vegetation x Weighting for each radius from the zone (eg. 40% x 0.03 = 1.2); then add values to obtain final Neighbourhood Value.

Distance to Core Area

Score

Distance	Core Area not significantly disturbed*	Core Area significantly disturbed*
> 5 km	0	0
1 to 5 km	2	1
< 1 km	4	3
contiguous	5	4

* defined as per RFA 'Old Growth' analyses.

Final Habitat Score

Component	'Site Condition Score'							'Landscape Context Score'			Total
	Understorey	Lack of Weeds	Recruitment	Organic Litter	Logs (if applicable)	Standardiser	Subtotal	Patch Size	Neighbourhood	Distance to Core Area	
Score											100

Appendix 3. Golden Sun Moth Habitat Quality Assessment Method (APA 2022; Biosis 2020a)

The weighting of these three attributes for *Golden Sun Moth Habitat* was defined as follows:

- Site condition – out of 3 - comprising an assessment of the condition of the threatened species habitat within the project in relation to the ecological requirements of the threatened species. Based on vegetation structure, native plant cover, species richness and presence of habitat resources.
 - 3/3= dominated by high quality native vegetation including >40% cover of known food source, appropriate inter-tussock space
 - 2/3= dominated by moderate quality native vegetation including between 20-40 % cover of known food source with limited inter tussock space
 - 1/3= dominated by poor quality native vegetation including <20% cover of known food source
 - 0/3= dominated by introduced vegetation with no known food source present
- Site context – out of 3 - comprising an assessment of the relative importance of the patches of the threatened species habitat in terms of its position in the landscape based on patch size, connectivity and proximity to threats. A patch is considered to be an area of suitable habitat (not constrained to the alignment corridor) separated from other areas of suitable habitat by >200 m of unsuitable habitat or barriers to flight
 - 3/3= habitat patch size is > 10 ha, shaped appropriately to reduce edge effects, slightly sloped and north-facing, minimal shading
 - 2/3= habitat patch size is > 10 ha, shaped appropriately to reduce edge effects
 - 1/3= habitat patch size is > 0.25 ha but < 10 ha
 - 0/3= habitat patch size is < 0.25 ha
- Species stocking rate – out of 4 – comprising an assessment of the density of the species across the area of suitable habitat. Density is calculated as an average across the area of suitable habitat, the average is weighted to consider survey areas.
 - 4/4 = >50 males per ha
 - 3/4= >20-50 males per ha
 - 2/4= >5-20 males per ha
 - 1/4= 0-5 males per ha
 - 0/4 = no moths present

Appendix 4. Striped Legless Lizard Habitat Quality Assessment Method (APA 2022; Biosis 2020b)

The weighting of 'site condition', 'site context' and 'species stocking rate' for *Striped Legless Lizard* Habitat was defined as follows:

- Site condition – out of 3 - comprising an assessment of the condition of the threatened species habitat within the project in relation to the ecological requirements of the threatened species. Based on vegetation structure, native plant cover, species richness and presence of habitat resources.
 - 3/3 = Good - Site (on average) supports a species-rich and structurally complex ground flora (reflecting appropriate biomass management). Dominated by an above average diversity of native tussock-forming grasses and above average native forbs, together with embedded and/or surface rock.
 - 2/3 = Satisfactory - Site (on average) supports a moderately diverse ground flora with good structural complexity (reflecting some biomass management). Dominated by an average diversity of native tussock forming grasses and average diversity of native forbs with or without embedded and/or surface rock.
 - 1/3 = Poor - Site (on average) supports a species-poor ground flora with low structural complexity (reflecting inadequate biomass management). Dominated by a few native or predominantly introduced tussock-forming grasses with no or very few native forbs with or without embedded and/or surface rock.
- Site context – out of 4 - comprising an assessment of the relative importance of the patches of the threatened species habitat in terms of its position in the landscape based on patch size, connectivity and proximity to threats
 - Connectivity score out of 2
 - 1/2= Site is < 0.5 ha
 - 2/2 Site is equal to > 0.5 ha
 - Threats that may impact upon Striped Legless Lizards have been categorised
 - Site currently subject to continuous, intensive grazing by livestock or kangaroos, thereby reducing the floristic and structural complexity of the habitat
 - Site subject to frequent, widespread and intense fires, including deliberate burns that are not sympathetic to the maintenance of Striped Legless Lizard habitat
 - Site subject to historical or ongoing ploughing, pasture improvement and agricultural intensification
 - Site subject to historical or ongoing removal of surface and/or embedded or rock
 - Site subject to frequent slashing thereby reducing the structural complexity of the habitat
 - Site dominated by exotic grasses to the extent that the majority of the site is no longer defined as native vegetation
 - Site currently not subject to any form of appropriate biomass reduction (e.g. low-moderate intensity grazing or sympathetic ecological burns to maintain structural and floristic diversity of the habitat)
 - 2/2= Site subject to none of the above threats
 - 1/2= Site subject to between one and four of the above threats

- 0/2 = Site subject to five or more of the above threats
- Species stocking rate – out of 3 – comprising an assessment of the density of the species across the area of suitable habitat. The method proposed by Biosis (2020b) uses the maximum number of Striped Legless Lizards detected at a tile grid during any one site survey as a surrogate for density. This includes counts of sloughs as well as actual lizards.
 - 3/3 = Three or more individuals or sloughs encountered under the tile grid during any one of seven monitoring events
 - 2/3 = A maximum of two individuals or sloughs encountered under the tile grid during any one of seven monitoring events
 - 1/3 = A maximum of one individual, or slough encountered under the tile grid during any one of seven monitoring events

Appendix 5. Risk Assessment Framework

RISK LEVEL		Likelihood				
		1	2	3	4	5
Consequence	1	Very Low	Very Low	Very Low	Low	Low
	2	Very Low	Low	Low	Low	Moderate
	3	Low	Low	Moderate	Moderate	High
	4	Low	Moderate	High	High	Very High
	5	Moderate	Moderate	High	Very High	Very High

Category Descriptions		
Likelihood		
1	<i>Rare</i>	Would only occur under exceptional circumstances (eg. 1 in 100-year event).
2	<i>Unlikely</i>	Could occur but considered unlikely (eg. 1 in 10-50-year event).
3	<i>Possible</i>	May occur under non-average circumstances during the offset management period (eg. 1 in 10-year event).
4	<i>Likely</i>	Will occur under average circumstances (eg. annually).
5	<i>Almost Certain</i>	Expected to occur under most circumstances (eg. multiple times per year).
Consequence		
1	<i>Insignificant</i>	No impacts on MNES or achievement of OMP objectives. Inconvenience for management only.
2	<i>Minor</i>	Some short-term impacts on MNES and/or achievement of OMP objectives. Remediation <1 year.
3	<i>Moderate</i>	Medium-term impacts on MNES and/or achievement of OMP objectives. Remediation 1-5 years.
4	<i>Major</i>	Long-term impacts on MNES and/or achievement of OMP objectives. Remediation >5 years.
5	<i>Catastrophic</i>	Irreversible impacts to MNES. OMP objectives cannot be achieved. Remediation not possible

Appendix 6. Annual Report Template

Table A4. Annual Report Template

Landowner name completing report					Trust for Nature Site ID	
Offset site address					Offset Management Plan No. (if applicable)	
Responsible Authority	Commonwealth Department of Climate Change, Energy, the Environment and Water				Annual Report No.	
Matters of National Environmental Significance		<i>Natural Temperate Grassland of the Victorian Volcanic Plain, Golden Sun Moth <i>Synemon plana</i>, Striped Legless Lizard <i>Delmar impar</i></i>				
Management Action	Performance Target	Management Activities Implemented	Timing	Performance Target Met? (Y/N)	Description of Actions and observed outcomes (Include or attach evidence of actions completed / comments / observed outcomes)	
Eg. Biomass Control	Maintain 20-40% bare ground	Strategic sheep grazing	All Year	Y		
Signed			Date			