

Boyers Road, Glenhope, Victoria:
Golden Sun Moth Offset Management Plan
(EPBC 2017/7930)

Prepared for Alliance Business Park Pty Ltd

24 February 2026

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Cover photo: Looking east from Sievers Lane. The offset site is just left of the dense stand of trees on the right-hand side of the image.

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- Tom Foley (MAB Corporation)
- [REDACTED]
- Julie Groce (Vegetation Link)

Biosis staff involved in this project were:

- Sally Mitchell (mapping)
- Mitchell Deaves (quality assurance)

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Declaration of accuracy

Alliance Business Park industrial development, Mickleham, Victoria (EPBC 2017/7930)

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the Environment Protection and Biodiversity Conservation Regulations 2000 (Cth). The offence is punishable on conviction by imprisonment or a fine, or both. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed

A handwritten signature in black ink, appearing to read 'David Hall', with a stylized flourish at the end.

David Hall
Chief Executive Officer
MAB Corporation Pty Ltd

Summary

Biosis Pty Ltd was commissioned by Alliance Business Park Pty Ltd (ABP), a subsidiary of MAB Corporation Pty Ltd (MAB), to prepare an Offset Management Plan (OMP) for an offset site required for impacts to Golden Sun Moth *Synemon plana* (GSM) habitat associated with the industrial and commercial development at 165 – 195 O'Herns Road, Epping, Victoria as outlined under EPBC Approval 2017/7930.

On 25 September 2018, the Department of the Environment and Energy (DoEE) (now the Department of Climate Change, Energy, the Environment and Water (DCCEEW)) approved the expansion of the Alliance Business Park project and the associated impacts to listed threatened species and ecological communities, subject to conditions (original EPBC approval). To compensate for the loss of 20.53 hectares of GSM habitat, ABP were required to offset 123.6 hectares of occupied GSM habitat. This was largely provided (114.1 hectares) at a suitable offset site near Glenhope, Victoria, known as Sievers Lane. The remaining 9.5 hectares was provided at a suitable offset site near Shelford, Victoria, known as Thurlgona.

On 23 May 2025, DCCEEW varied the conditions of EPBC 2017/7930 in response to non-compliance with several conditions of the original EPBC approval (varied EPBC approval). The conditions of the revised EPBC approval require an additional offset of 7 hectares of occupied GSM habitat (additional offset area) to compensate for impacts to 1.22 hectares of GSM habitat within the ABP development footprint.

The additional offset area of 7 hectares at Boyers Road, Glenhope is located within a similar environment on a property adjacent to the eastern boundary of the original Sievers Lane offset site. The additional offset area has been the subject of a targeted survey for GSM which has been recorded at numerous locations across the Boyers Road property (Hamilton Environmental Services 2020).

While some of the 7 hectare offset site is not considered to be native vegetation (i.e. the perennial groundcover / understorey doesn't support a minimum of 25% cover of indigenous species) it still represents moderate quality habitat for GSM. The 7 hectare area, in conjunction with 114.1 hectares provided at Sievers Lane (Biosis 2018) and 9.5 hectares provided at Thurlgona (Biosis 2018) provides a total offset area of 130.6 hectares. This area provides greater than a 100% direct offset for the impact to GSM, amounting to an offset of about 5.9 times the impact to its habitat at the extension to Alliance Business Park.

The offset site will be secured in-perpetuity through an appropriate legal encumbrance registered on the property (a covenant as to part Section 3A *Victorian Conservation Trust Act 1972*). Gains in vegetation and GSM habitat quality through on-ground actions are expected over the duration of the 10 year offset management plan, and through the ongoing land-use commitments to manage the offset site for biodiversity conservation.

This plan specifies a range of management actions for the offset area, including weed management, management of tree and shrub recruitment, and protection of the habitat values of the offset site from degradation by stock and unauthorised access. The plan documents an adaptive management framework, in which management actions are modified based on the results of monitoring and auditing activities in order to keep management focussed on the outcome of protecting and enhancing GSM habitat. The risk assessment also includes triggers for plan review, following environmental events such as significant weed invasion that has the potential to significantly alter the character and condition of the offset site.

1. Introduction

1.1 Project background

Biosis Pty Ltd was commissioned by Alliance Business Park Pty Ltd to prepare an Offset Management Plan (OMP) for a Golden Sun Moth *Synemon plana* (GSM) offset site required for impacts associated with the Alliance Business Park (ABP) industrial and commercial development at 165 – 195 O'Herns Road, Epping, Victoria (impact site) as outlined under EPBC 2017/7930 (Figure 1).

An ecological assessment of the impact site, including a habitat hectare assessment, is documented by Biosis (2017a). That report identifies the condition and extent of native vegetation, including areas of Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) and habitat for GSM and Matted Flax-lily *Dianella amoena* to be both impacted and protected in association with the proposed development (Figure 2). Biosis (2017a) was used, in conjunction with the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) offsets policy (DSEWPaC 2012), to identify the extent of NTGVVP, and habitat for GSM and MFL to be protected outside the impact site.

A Planning Permit application has been approved by the City of Whittlesea for the industrial subdivision (716886). Clearing associated with the development of the subdivision was also assessed by the Department of Environment, Land, Water and Planning (DELWP) (now the Department of Energy, Environment and Climate Action – DEECA) as part of the development approvals process.

On 25 September 2018, the Department of the Environment and Energy (DoEE) (now the Department of Climate Change, Energy, the Environment and Water (DCCEEW)) approved the expansion of the Alliance Business Park project and the associated impacts to listed threatened species and ecological communities, subject to conditions (original EPBC approval 2017/7930). To compensate for the loss of 20.53 hectares of GSM habitat, Alliance Business Park Pty Ltd were required to offset 123.6 hectares of occupied GSM habitat. This was largely provided (114.1 hectares) at a suitable offset site near Glenhope, Victoria, known as Sievers Lane. The remaining 9.5 hectares was provided at a suitable offset site near Shelford, Victoria, known as Thurlgona.

On 23 May 2025, DCCEEW varied the conditions of EPBC 2017/7930 in response to non-compliance with several conditions of the original EPBC approval (varied EPBC approval). The conditions of the varied EPBC approval require an additional offset of 7 hectares of occupied GSM habitat (additional offset area) to compensate for impacts to 1.22 hectares of GSM habitat within the ABP impact site.

The overall development of APB has been completed. However, additional works within the creek corridor to prevent future erosion events is pending. The impacts associated with those works are factored into the varied EPBC approval.

The additional external EPBC Act offset for GSM is proposed to be sourced from a 7 hectare section [REDACTED] at Boyers Road, Glenhope (Figure 3). An ecological assessment of the proposed external offset area was conducted by Biosis (2023). The offset site will be legally secured by way of a covenant made pursuant to the Victorian *Conservation Trust Act 1972* between the owner of [REDACTED] Boyers Road, Glenhope and Trust for Nature (TfN).

This EPBC Act offset is a stand-alone offset and will not be utilised under any other offset program. The State offset management documents use DEECA's Native Vegetation Credit Register templates and will subsequently be approved by DEECA. The content of the State offset documents is reflected in this EPBC Act OMP but this OMP has been tailored to meet the specific requirements of the EPBC Act guidelines for the preparation of an offset management plan (DoE 2014).

This OMP has been reviewed by Trust for Nature and by the landowner, with both being given the opportunity to provide feedback prior to its approval

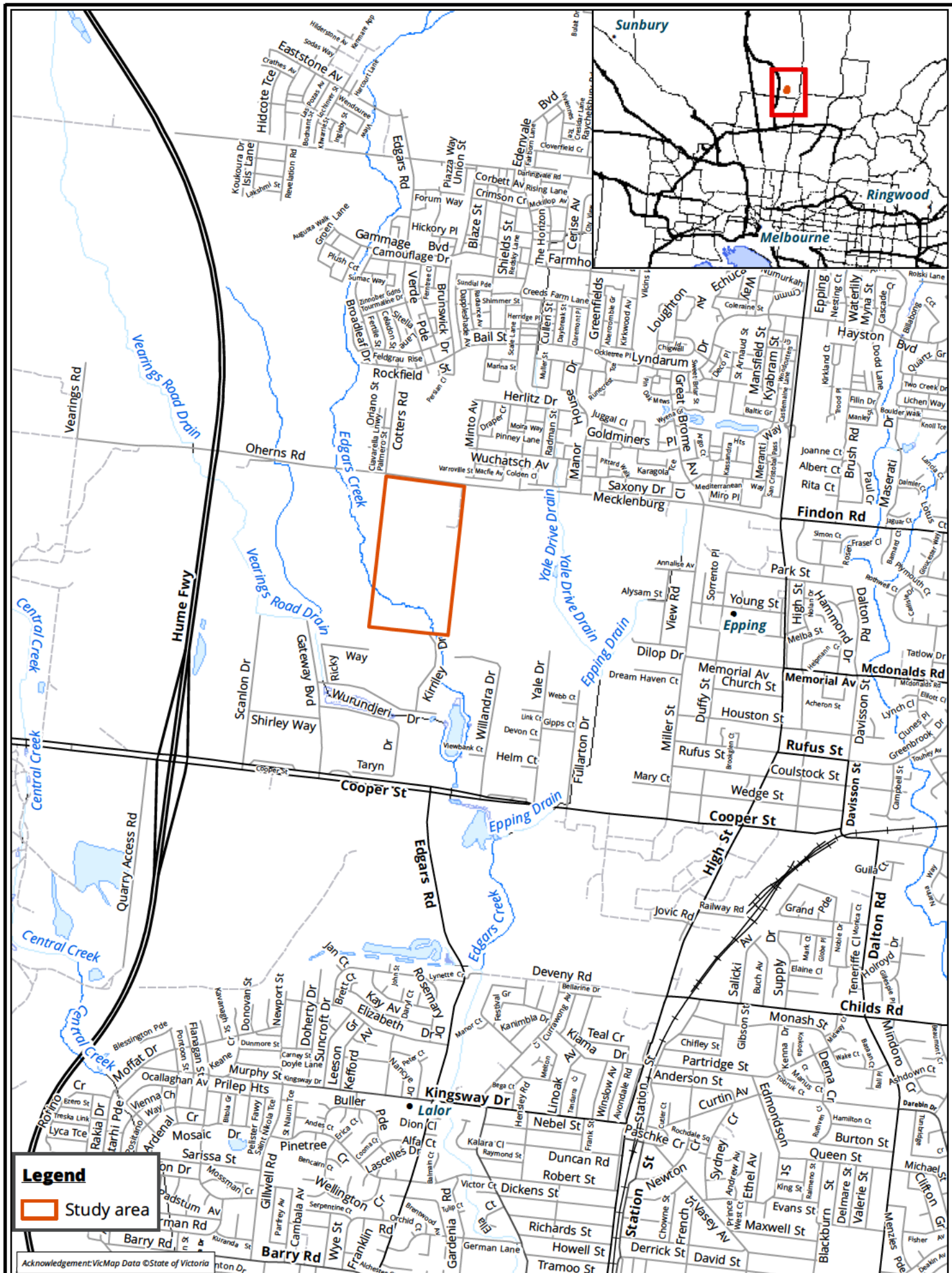
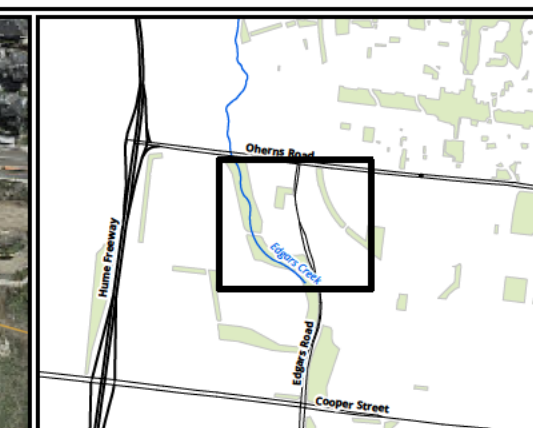
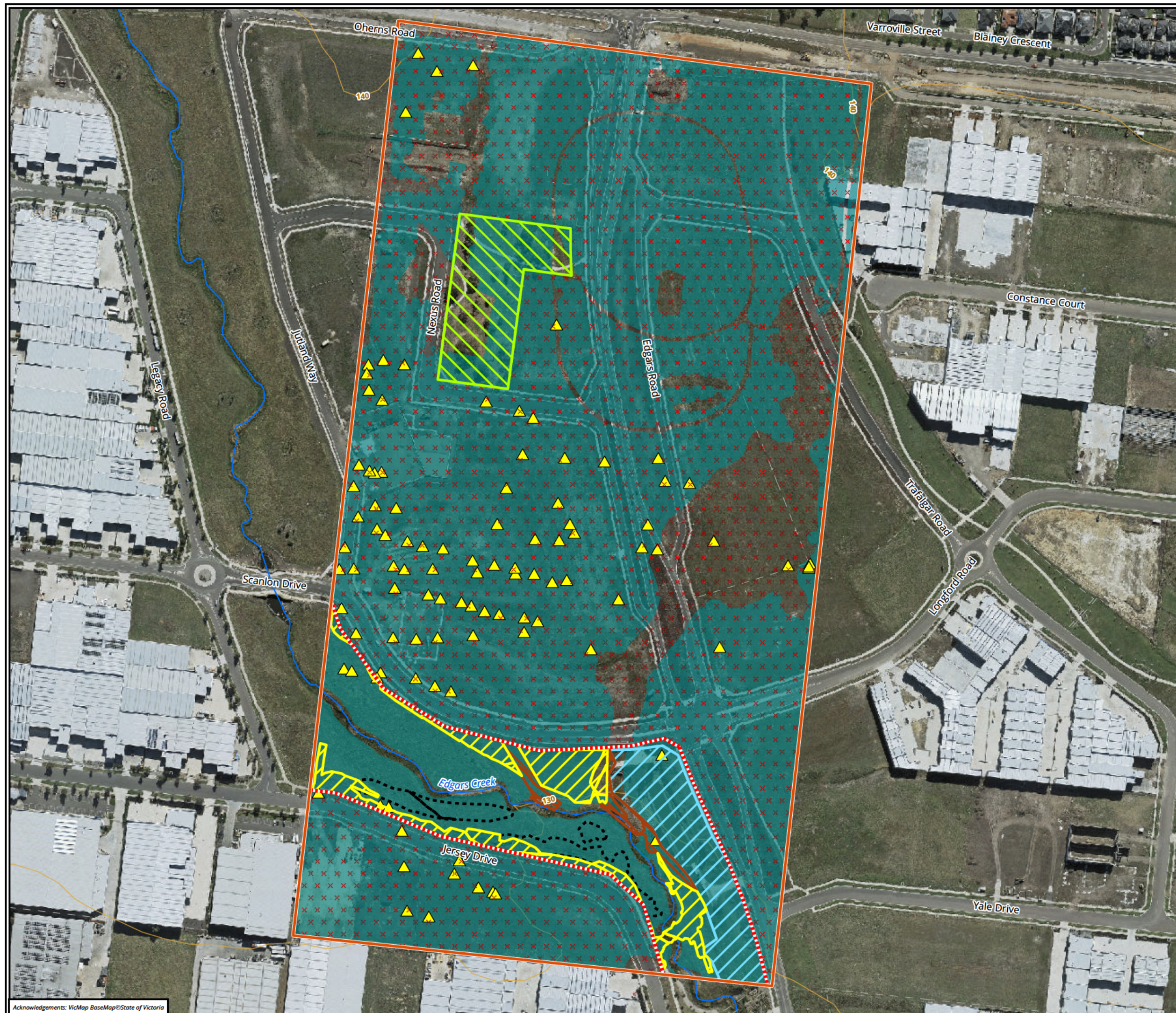


Figure 1 Location of the study area, 165 -195 O'Herns Road, Epping, Victoria



Legend

- Study area
 - Fenced No-Go Zone - Edgars Creek waterway reserve
 - ▲ Golden Sun Moth record
 - Golden Sun Moth habitat (26.60 ha)
- Disturbance**
- 1. Alliance Business Park development (as per PD)
 - 2. Additional clearance within Edgars Creek Corridor - Contractor
 - 3. Additional clearance within Edgars Creek Corridor - Melbourne Water
 - 4. Proposed erosion remediation and mitigation works/ infrastructure within Edgars Creek Corridor
 - 5. Assumed loss of GSM habitat within the Woodland Reserve
 - Wetland approved

Figure 2: Golden Sun Moth habitat within Alliance Business Park, Epping, Victoria

0 20 40 60 80 100
Metres
Scale: 1:3,000 @ A3
Coordinate System: GDA2020 MGA Zone 55



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Project: P:\38900s\38934\Mapping\38934_Alliance2023EPBC.aprx

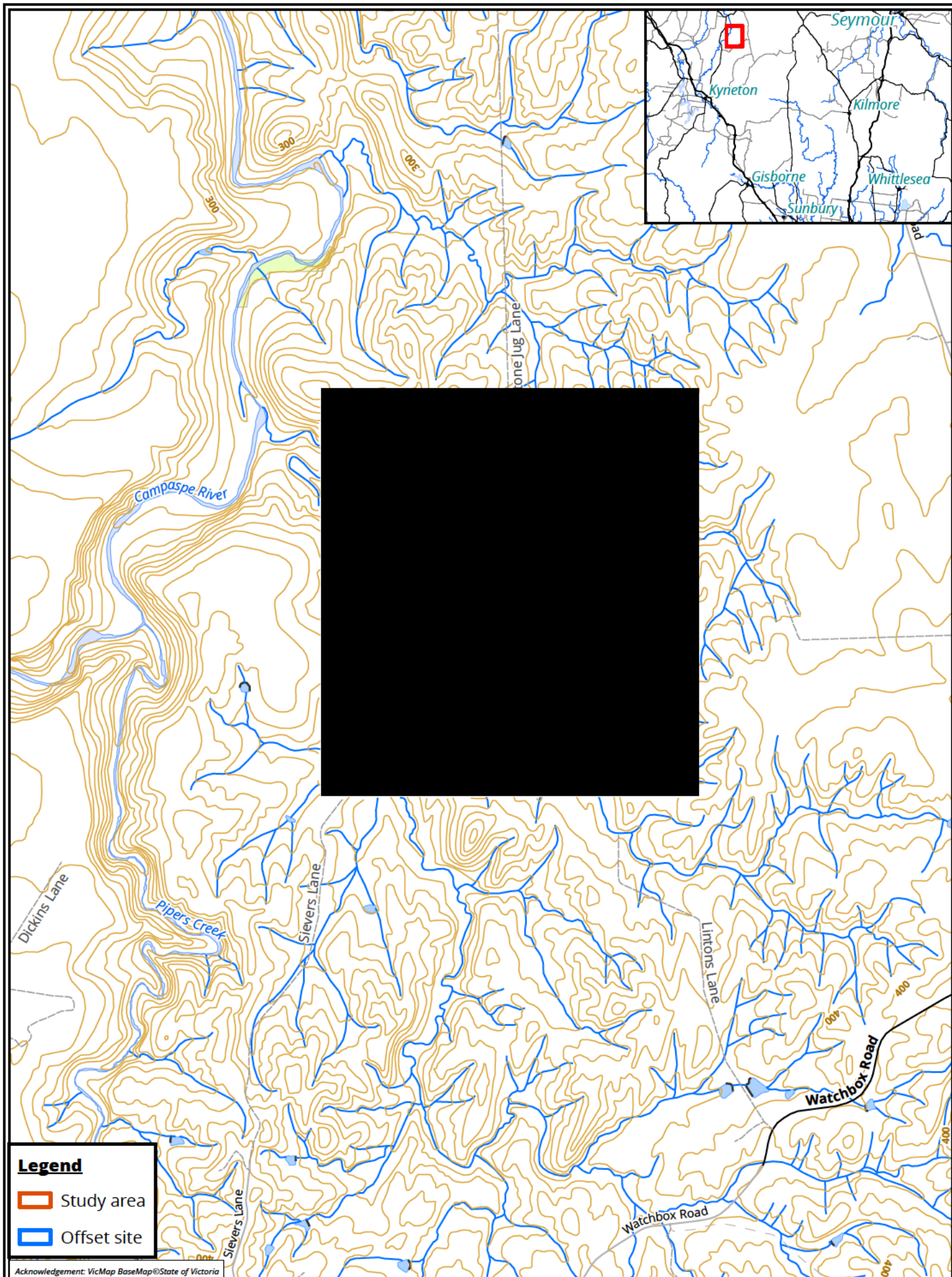


Figure 3 Location of the Boyers Road offset site, Glenhope, Victoria

1.2 Objectives

The objectives of the OMP are to document the clearing site and offset site details to meet EPBC Act approval requirements of offsetting impacts to GSM by securing, maintaining and improving GSM habitat within the designated offset site. The objectives of this plan are to:

- Identify the area with the Boyers Road property that is nominated as an offset site, and:
 - To provide an offset plan to the satisfaction of the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW);
 - Develop an OMP to compensate for the permitted loss of habitat as part of the proposed Project. This will include but not be limited to the following:
 - Means of calculating the offset;
 - Location of the offset site;
 - Type of offset to be provided;
 - Identify the necessary management actions to protect and improve GSM habitat within the offset site and the strategy for adaptive management.
 - Details of management actions for remnant habitat;
 - Detail 'security' arrangements;
 - Provide a map of the offset site;
 - Develop a timetable of management actions, outcomes and progress reviews; and,
 - Detail appropriate monitoring and evaluation of management actions

1.3 GSM habitat quality

The approved GSM habitat scoring protocol is provided in Appendix 1. Application of this protocol generates a habitat score between 0 and 10, allowing potential changes in habitat quality to be assessed.

1.4 Report structure

The structure and content of the OMP is consistent with the requirements of the 'Standard Offset Plan' template provided by DEECA and is organised in a number of parts:

- **Introduction** - This section summarises the background information relevant to the Project, including the purpose and scope of the work and the assessment methodology.
- **Part A: Offset Suitability** - This section assesses the suitability of the proposed offset site, and includes details regarding approved clearing, gain and site improvement calculations. Part A should be read in conjunction with Part B, but due to its technical nature, the information it contains is not intended to be placed on title (e.g. Covenant under the Victorian *Conservation Trust Act 1972*).
- **Part B: Offset Implementation** - This section describes how the offset is to be implemented. Part B includes details regarding landowner commitments, management activities, adaptive management strategies, monitoring and reporting. This section is intended for those responsible for implementing the OMP, including future landowners. Information in this section is intended to be placed on title.

The plan also incorporates the requirements of guidelines for the preparation of an offset management plan under the EPBC Act offsets policy (Commonwealth of Australia 2014).

2. Part A: Offset suitability

This section provides details of the impact site, assesses the suitability of the proposed offset site, and includes details regarding approved clearing, gain and site improvement calculations. This section should be read in conjunction with Part B, but due to its technical nature, the information it contains is not intended to be placed on title (e.g. Covenant under the *Victorian Conservation Trust Act 1972*). The location of the impact site and the proposed offset site are provided in Figures 1 and 3 respectively.

2.1 Impact Site Details

Table 1 describes the impact site details under Commonwealth and Victorian jurisdictions.

Table 1 Impact site details

Impact site details	
Location and address of impact site	165 – 195 O'Herns Road, Epping, Victoria
Local Government Area	City of Whittlesea (Whittlesea Planning Scheme)
Catchment Management Authority	Port Phillip and Western Port
Responsible Authority	Department of Energy, Environment and Climate Action
Permit applicant	Alliance Business Park Pty Ltd
Planning Permit Reference	City of Whittlesea Planning permit issued on 21 November 2017 (Ref. 716886)
EPBC Act Approval	EPBC 2017/7930 Original approval dated 25 September 2018 Varied approval dated 23 May 2025

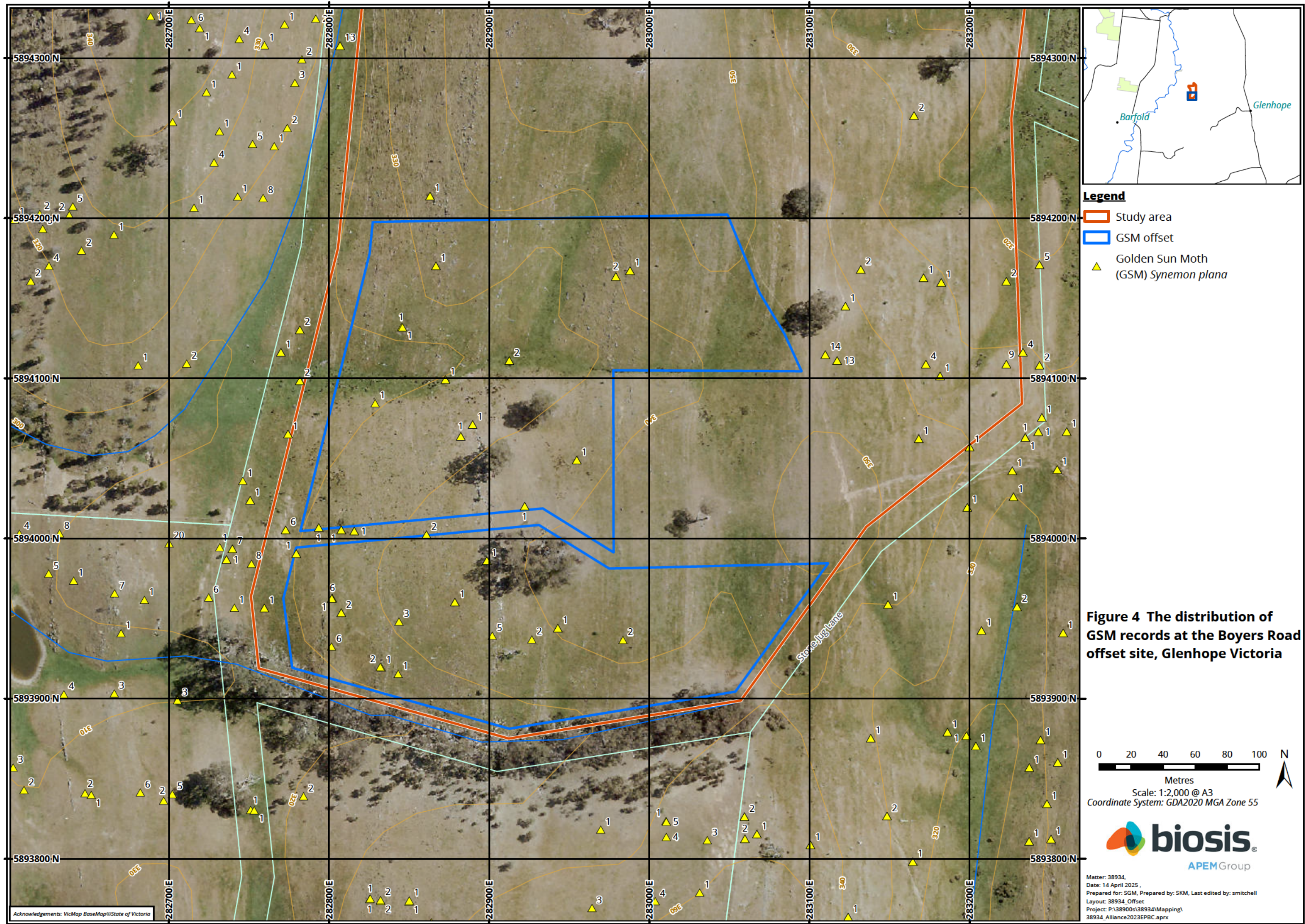
2.2 Vegetation Approved for Removal

Vegetation / habitat removal associated with the expansion of Alliance Business Park (Figure 1) has been approved under the City of Whittlesea Planning Permit 716886. Vegetation for removal is described in the biodiversity assessment prepared by Biosis (2017a) and the 21.75 hectares of GSM habitat impacted is identified in Figure 2.

2.3 Description of offset site – Boyers Road, Glenhope, VIC

The nominated offset site at Boyers Road, Glenhope (7 hectares), has been identified as meeting Commonwealth offset policy requirements, as of October 2012. In combination with a 114.1 hectare offset site at Sievers Lane (Biosis 2019a) and a 9.5 hectares offset site at Shelford (Biosis 2019b), Alliance Business Park will provide a total offset package of 130.6 hectares of occupied GSM habitat for its approved expansion. The following summarises the existing conditions at the Boyers Road offset site, including current permitted uses on the and its suitability as an offset as assessed against Commonwealth requirements.

The proposed offset site is located in central Victoria near the locality of Glenhope, approximately 87 kilometres north north-west of the Melbourne central business district (Figure 2). The property is on the northern bank of an un-named ephemeral creek that flows into Watchbox Creek and ultimately the Campaspe River and is also north of a 'paper' road reserve which has been excluded from the offset area calculation. A substantial population of GSM was recorded across the property and within the offset area in 2020 (Hamilton Environmental Services 2020) (Figure 4).



2.3.1 Habitat description

The offset site is located within the Goldfields Bioregion (<http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit>) and is dominated by undulating hills with a sedimentary geology. The offset site supports a relatively low tree cover including three scattered Grey Box *Eucalyptus microcarpa* and a small stand of mature Grey Box near the centre of the site.

DEECA identifies the native (pre-1750) vegetation of the site as the ecological vegetation classes (EVC) Heathy Dry Forest (EVC 20). The remnant understorey native vegetation within the offset area is therefore a derived grassland.

Shrubs are typically absent apart from a few scattered Tree-violet *Melicytus dentatus*.

A modified ground cover is variously dominated by annual introduced grasses such as Oats *Avena* spp., Bromes *Bromus* spp., Fescue *Vulpia* spp. and Rye-grass *Lolium* spp. There are also patchy areas of perennial pasture species (weeds) such as Brown-top Bent *Agrostis capillaris* and Yorkshire Fog *Holcus lanatus*.

Native ground cover species are scattered across the site and occasionally form smaller patches which would be classified as native vegetation. Common species include Wattle Mat-rush *Lomandra filiformis*, Common Wheat-grass *Anthosachne scabra*, Weeping Grass *Microlaena stipoides*, Spear-grasses *Austrostipa* spp., Kangaroo Grass *Themeda triandra* and Wallaby-grasses *Rytidosperma* spp.

The site is part of a broader area of undulating hills which are typically rocky and appear to have been overlooked for cultivation. The ground cover is relatively open and perennial grasses provide an open tussock structure with bare rock and open ground readily apparent.

Relatively flat areas are uncommon. These areas tend to have a more uniform and dense cover of grass except where rocky ground makes that cover discontinuous.

The open nature of the grassy ground cover and the scattered to common presence of suitable food plants (such as Wallaby-grasses and Spear-grasses) provides the suitable habitat requirements for GSM.

2.3.2 Offset Site suitability

The proposed offset site supports a population of GSM remote from the impact area. It is part of a relatively large population of GSM extending over a broader area of similar habitat.

ABP is within the Melbourne urban growth boundary but just outside the area covered by the Melbourne Strategic Assessment (DSE 2009). As part of the broader development of Melbourne's expanded urban growth boundary, the Victorian Department of Energy, the Environment and Climate Action (DEECA) have developed a broader conservation strategy for GSM in the Melbourne region (DEPI 2013). As such it is considered that conservation efforts for this species are well catered for in the Melbourne region and the protection of more remote populations is appropriate for the conservation benefit of this species.

The protection of more remote populations of this species across its natural range is therefore considered to provide a positive conservation outcome for this vulnerable species.

2.3.3 Site condition

The proposed offset site has been subject to past land clearing for the grazing of domestic stock (sheep and cattle). It has been subject to some level of pasture improvement activities which has established a patchy cover of selected agricultural grasses such as Wimmera Rye-grass, but is otherwise poor quality pasture dominated by Brown-top Bent *Agrostis capillaris* and a variety of indigenous grasses. While the site may have been subject to some level of fertilizer application, the existing vegetation suggests any application has been infrequent if not absent.

While significant portions of the ground cover does not support a sufficient cover of perennial native species to be defined as native vegetation (i.e. Victoria's definition of native vegetation requires 25% of the perennial ground cover to be composed of native species for areas to be defined as a patch of native vegetation), the rocky sedimentary slopes do support patches of spear-grasses, wallaby grasses and Kangaroo Grass which achieve this threshold.

Weed cover is typically dominated by annual introduced grasses. However, noxious weeds such as Spear Thistle *Cirsium vulgare*, Gorse *Ulex europaeus*, and Briar Rose *Rosa rubiginosa*, while present at relatively low abundance, retain the potential to degrade the GSM habitat present.

Shrub and tree regeneration is present but the development of the vegetation from an open grassland to a shrubland or woodland is constrained by browsing by domestic stock and presumably the local population of Eastern Grey Kangaroos.

There were no obvious signs of the presence of European Rabbit (scratchings and latrine sites) but this significant pest species is also likely to be present.

2.3.4 Current permitted land uses

The property is zoned Farming Zone (FZ) within the Mitchell Shire Planning Scheme. The purpose of the FZ is to provide for the use of land for agriculture including the establishment of plantations for timber production over areas of at least 40 hectares.

The property is also subject to the Environmental Significance Overlay (ESO2). The objective of the ESO is to protect and maintain water quality and water yield in the Eppalock and Mollison Creek (Pyalong) Special Water Supply Catchment Areas. However, this ESO provides no restrictions for normal agricultural activities such as grazing, fencing, timber production etc.

Within Victoria, removal of native vegetation is controlled under Clause 52.17 of the Victoria Planning Provisions. Some removal of native vegetation is currently permitted (exempt from a planning permit requirement – See Clause 52.17-7) to the minimum extent possible, for activities including:

- Removal of dead vegetation.
- Removal of vegetation for construction of a boundary fence.
- Mowing of understorey grass vegetation to a height of 100 mm above ground level.
- Grazing by domestic stock.
- Timber harvesting of 'reasonable amounts' for personal use, including firewood and construction of fences or buildings.
- Pruning of up to 1/3 of the foliage of individual plants.
- Treatment of pest animal burrows or weed infestations.
- Stone exploration or extraction.
- Fire protection, including periodic fuel reduction burning or construction of firebreaks and fire fighting access tracks.

There are no existing buildings within the property in which the proposed offset area is located.

2.3.5 Existing offset arrangements

The proposed offset area has not been allocated for the provision of any other offsets, either under the EPBC offsetting policy or for provision of offsets under Victorian policy, including the Biodiversity Assessment Guidelines or the Net Gain Framework.

Other sections of the property contain habitat and recorded individuals of GSM. These sections may be subject to separate, future offset arrangements for other projects.

3. Part B: Offset Implementation

This section presents the actions required to implement the OMP. The OMP details methods for the management and conservation of native vegetation at the offset site for the protected matter (GSM) over the minimum required ten year management period and from thereon in perpetuity.

The aim is to implement the offset either before, or at the same point in time as, the impact arising from the action. This timing is distinct from the time it will take an offset to yield a conservation gain for the protected matter, which may be a point in the future.

All works would be conducted by a suitably qualified and experienced contractor and/or the landholder. Prescribed management actions are, where relevant, in accordance with the Victorian standards for the management of offset sites (DEECA 2023).

The OMP aims to achieve habitat improvement gains through on-ground actions and therefore is required to be achievable, straightforward and practical. All the management actions specified must be measurable, adaptive and support the offset completion criteria.

The management actions in this OMP have been informed by the relevant EPBC Act conservation planning documents for the species, including the Approved Conservation Advice for *Synemon plana* and the Significant impact guidelines for the critically endangered (subsequently downlisted to vulnerable) golden sun moth (*Synemon plana*).

The species-specific significant impact guidelines emphasise the importance of maintaining open inter-tussock structure, preventing biomass accumulation, avoiding soil disturbance, reducing competitive weed loads, and managing pest animals that degrade habitat. The Boyers Road OMP reflects these principles through:

Targeted weed reduction to maintain open GSM-suitable grassland structure.

- Biomass control via pulse-grazing and ecological burning to retain inter-tussock spaces and avoid grassland thickening.
- Pest animal management (rabbits, foxes, hares) to prevent soil disturbance and habitat degradation.
- Exclusion of incompatible land uses, including uncontrolled grazing, firewood collection and vehicle access.
- Structured GSM monitoring along fixed transects to detect changes in habitat condition and population persistence.

These actions are consistent with the species-specific significant impact guidelines because they directly minimise the ecological pathways that would increase the likelihood of a significant impact.

3.1 EPBC Act approval conditions

This OMP has been formulated to comply with the varied conditions of EPBC Act Approval 2017/7930. Relevant conditions, how the OMP addresses these conditions and references to corresponding sections of this plan are detailed in Table 2.

Table 2 OMP response to varied EPBC Act approval conditions

Condition	Condition details (summarised)	OMP response	OMP section reference
2A	To compensate for the loss of 1.22 ha of Golden Sun Moth habitat, the approval holder must, by 31 October 2025, submit to the department for the Minister's approval, an Offset Management Plan for the Boyers Road offset area.	This OMP document will be submitted to DCCEEW for approval.	This OMP.
2C	The Offset Management Plan (OMP) submitted in accordance with condition 2A, must:		
2C (a)	Be prepared by a suitably qualified ecologist.	The OMP was prepared by Stephen Mueck, Principal Botanist with Steve Mueck Biodiversity Pty Ltd as a subconsultant to Biosis, who holds post-graduate ecological qualifications and significant ecological consulting experience. He is familiar with both the impact and offset sites and the management requirements of the offset site.	This OMP was prepared by Steve Mueck (steve@stevemueckbiodiversity.au), a suitably qualified ecologist with more than three years of experience preparing GSM management plans. Biosis, as the implementing organisation, has an established record of delivering offset management actions for this species, satisfying the implementation component of the definition under the approval. Evidence was submitted to the Department on 19/01/2026 and was confirmed as meeting Condition 2C(a) on 20/01/2026 (evidence held in Departmental records).
2C (b)	Include maps and a description of the relevant offset area including location, habitat quality and the current area of habitat for Golden Sun Moth.	Maps and written descriptions are provided in the OMP. Digital shapefiles will be provided to DCCEEW during the post approval process.	See Section 2.3, Figure 3 and Figure 4. Shapefiles will be submitted to DCCEEW via email.
2C (c)	Specify the method used for assessing habitat quality specific to Golden Sun Moth.	GSM habitat – quality scoring system provided	Appendix 1.

Condition	Condition details (summarised)	OMP response	OMP section reference
2C (d)	Specify offset completion criteria that will be used to assess whether the outcomes required under condition 2I of this approval have been achieved or maintained.	The OMP specifies key environmental outcomes / criteria to be achieved through protection and management of the offset area.	See Section 3.5.1 - 3.5.2.
2C (e)	Include timebound commitments to achieve the specified offset completion criteria.	The OMP provides a schedule of standards to be achieved for implementing the offset over 10 years.	See Section 3.9 and Table 6 in Section 4.
2C (f)	Include timebound interim targets derived from the offset completion criteria, that will be achieved to demonstrate progress consistent with attainment or maintenance of those completion criteria.	The OMP provides a schedule of standards to be achieved for implementing the offset over 10 years.	See Section 3.9 and Table 6 in Section 4.
2C (g)	Detail the management activities, including timeframes or circumstances for implementing those activities, that will be implemented to achieve the interim targets and offset completion criteria.	The OMP provides a schedule of management actions for implementing the offset over 10 years.	See Section 3.9.1 - 3.9.5 and Table 6 in Section 4.
2C (h)	Detail the nature, timing and frequency of monitoring activities that will be implemented to: • detect changes in habitat quality for Golden Sun Moth at the offset area; and • demonstrate attainment of interim targets and offset completion criteria, and detect potential or actual failure to achieve or maintain interim targets and offset completion criteria.	The OMP provides a monitoring program for the 10 year period.	See Section 3.10.1 - 3.10.7 and Table 8 in Section 4.
2C (i)	Detail timebound, feasible and effective corrective measures, to be implemented in the event monitoring indicates any potential or actual failure to achieve or maintain interim targets and offset completion criteria.	The OMP includes a risk assessment and adaptive management actions.	See Section 3.8 and Table 7 in Section 4.

Condition	Condition details (summarised)	OMP response	OMP section reference
2C (j)	Include a risk analysis, and risk management and mitigation strategy, for all risks to the successful implementation of the Offset Management Plan, including a rating of all initial and post-mitigation residual risks.	The 10-year management plan has been evaluated in a risk framework and contingencies developed if monitoring reveals the need for remedial action (i.e. adaptive management approach).	See Table 7 in Section 4 and Appendix 2.

3.2 Offset site details

Table 3 provides details of the offset site, including the landowner, parcel details and local government property information.

Table 3 Offset Site Details

Offset Site Details	
Landowner of offset site	[REDACTED] Vic 3444
Type of offset	3 rd party
Location and address of offset site	[REDACTED]
Area of offset site	7 hectares
Parish	Glenhope
Allotment	[REDACTED]
Volume / Folio	[REDACTED]
Local Government Area	Mitchell Shire
Council Property Number	[REDACTED]
Bioregion	Goldfields

3.3 Strategy for Offset Site

The offset site is to be secured and managed for the purposes of conservation in perpetuity. This offset area is a smaller component of a larger area of farmland within the same ownership. The current landowners have secured formal offset agreements to protect other portions of this broader area of GSM habitat but the nominated section of this parcel has not been allocated for the provision of any other offsets, either under the EPBC offsetting policy or for provision of offsets under Victorian policy, including the Biodiversity Assessment Guidelines or the Net Gain Framework.

All easements noted on the current title have been excluded from the net offset area. No future easements can be applied to the offset area as these are likely to conflict with the objectives of this OMP.

3.4 Offset security, management responsibility and reporting requirements

Alliance Business Park Pty Ltd has located a suitable offset site and negotiated an agreement with the owner(s) of the property. The proposed offset area is located within a larger property on Boyers Road, Glenhope. The property is owned by [REDACTED] (or other future owner), who will be responsible for ongoing management of the offset site throughout the period of this plan.

The offset site will be secured and managed for the purposes of conservation in perpetuity via covenant as to Section 3A *Victorian Conservation Trust Act 1972* managed by the Trust for Nature (TfN). The management strategy for the proposed offset site consists of implementing a vegetation OMP incorporating the management of ground cover biomass using the timed grazing of domestic stock, weed and vermin control and regular monitoring. Details of security and management responsibility are shown in Table 4.

Table 4 Security and Management Responsibility and Reporting Requirements

Responsibility	
Who is liable/responsible for meeting offset requirements?	Alliance Business Park Pty Ltd
Type of security	Covenant as to part Section 3A <i>Victorian Conservation Trust Act 1972</i>
Date of commencement for the covenant	On registration of the TFN Deed of Covenant on title
Date 10-year offset management to commence	On registration of the TFN Deed of Covenant on title.
Date 10-year offset management expires	10 years after registration of the TFN Deed of Covenant on title.
Date agreement registered on-title	On registration of the TFN Deed of Covenant on title
Offset site management responsibility	[REDACTED]
Offset Monitoring Responsibility	[REDACTED]
Site management	[REDACTED]
Monitoring	[REDACTED]
Auditing	Alliance Business Park Pty Ltd
Reporting responsibility (to TfN)	[REDACTED]
Reporting responsibility (to DCCEEW)	Alliance Business Park Pty Ltd
Plan review	Alliance Business Park Pty Ltd

The offset area will be secured in-perpetuity via a covenant as to part Section 3A *Victorian Conservation Trust Act 1972*, to be registered on the title as soon as possible after OMP approval by DCCEEW. The encumbrance registered on title requires the landholder and future owners to manage the land in accordance with this OMP or any future approved revisions of this plan.

Implementation of this management plan is the overall responsibility of ABP, which has engaged the landowner [REDACTED] to deliver the offset outcomes on ABP's behalf. However, direct management responsibility may be delegated to a designated site manager and/or managing ecologist. The landowner is responsible for engaging a qualified ecologist to conduct monitoring (Section 3.10) with reports submitted to TfN, ABP and DCCEEW. Management actions by the landowner will be overseen by the TfN as part of the legal protection over the site.

The TfN is responsible for:

- Undertaking site inspections at least 4 times over the initial 10 year period and provide advice in relation to the annual works program.
- Monitoring and supporting the landowner in meeting the obligations of the offset covenant.

Implementation of the management plan will be monitored by the TfN, who will verify that the management actions have been carried out appropriately.

Implementation of the OMP will begin upon registration of the TFN deed of covenant on title (Table 4), which is expected to occur in 2026. ABP will pay all the prescribed fees through an offset trade agreement within two months of approval of this OMP. These fees will be non-refundable and the covenant registration will therefore be an administrative formality.

Funding for implementation of this OMP has been agreed between ABP, the landowner and TfN. Where appropriate, or otherwise agreed, funding will be held by the TfN and paid to the landowner over the 10 year management period as per a landowner agreement.

3.5 Offset completion criteria

Within 10 years following the Minister's approval of this OMP, habitat quality scores for GSM (Appendix 1) will achieve a score of at least 7 out of 10.

The current GSM habitat quality score for this offset site is assessed as 6 out of 10 (Appendix 1) based on the following information. The offset site is part of a larger property covering approximately 170 hectares with survey records of GSM covering much of this area (Hamilton Environmental Services 2020). The Site Context score is therefore assessed as 3 out of 3. The Site Condition score is identified as 1 out of 3 and the Stocking Rate score is identified as 2 out of 4.

The key environmental outcomes / criteria to be achieved through protection and management of the offset area are:

- Permanent legal protection of 7 hectares of GSM habitat.
- Physical protection of the habitat area from manageable threats including uncontrolled stock grazing, weed infestations and degradation by pest animals.
- Attainment of GSM habitat condition completion criteria, as measured by habitat monitoring.

3.5.1 Future site condition - completion criteria

The 7 hectare offset site must achieve the following minimum site condition:

- a) be dominated by moderate quality native vegetation (VQA site condition score 31-45/75) including between 20% and 40% cover known food source for GSM with limited inter-tussock space (<5%).

Approximately 80% the site is currently dominated by poor quality native vegetation with a VQA site condition score of less than 30, with the balance of the site dominated by introduced pasture grasses with scattered GSM food plants (this vegetation cannot be scored as it fails to reach the minimum prescribed cover of native vegetation). This initial condition will be detailed by a baseline site condition survey (Section 3.10.1).

Monitoring assessments will be undertaken in marked quadrats distributed through the offset site as described in Section 3.10. A key performance target, to assist in attainment of (a), is a continuous decline in the abundance of perennial, introduced pasture grasses such as Brown-top Bent and concomitant increase in the density of perennial native grass species. This will increase the VQA site condition score by increasing both the Lack of Weeds score component and the Understorey Score component.

Attaining the nominated future condition class of 2 out of 3 (Appendix 1) will require the VQA site condition score to be between 31 and 45 out of 75 and the ground cover to include between 20% and 40% cover of known food grasses with at least some inter-tussock spaces (at least 5%) although a greater cover of inter-tussock spaces (up to 20%) is targeted. This will increase the Site Condition score from 1 out of 3 to 2 out of three providing the overall increase in GSM habitat condition from 6 out of 10 to 7 out of 10.

3.5.2 Performance criteria

Key performance criteria for this OMP are:

- Continuous improvement in average site condition as described in Section 3.5.1.
- Effective threat abatement, including the control of stock grazing, weeds and pests as specified in Section 3.9.
- Completion of scheduled management actions (Section 3.9 and Table 6).

- Completion of scheduled monitoring activities (Section 3.10 and Table 8).
- Completion of scheduled reports and audits (Section 3.11, 3.12 and Table 9).

3.6 Limitations and uncertainty

This management plan has been formulated using information from recently conducted site inspections (Biosis 2023). The OMP has been subject to external review and quality assurance by TfN as part of the process to register the site covenant. Relevant federal and state government policies, procedures and databases have also been consulted where appropriate.

The proposed offset site supports a population of GSM, which has been confirmed by recording the species within the offset site during targeted surveys in the 2020 flight season (Hamilton Environmental Services 2020).

The OMP includes a reasonable expectation that the control of environmental weeds to reduce their cover and prevent / restrict their production of seed, while concurrently encouraging the growth and seed production of the existing cover of indigenous grasses, will result in an increase in the abundance and cover of native grasses. As most of the native grasses present are GSM food plants, this management strategy is expected to improve the habitat condition for GSM. However, there is a possibility that the recruitment of indigenous species will be slower than expected or prolonged drought conditions may inhibit recruitment.

If seed production is restricted by unforeseen circumstances such as drought then seed collection and dispersal options would be investigated. Alternatively the time period for active management would be extended to compensate for any lag in the establishment of native grasses.

3.7 Ongoing management commitments

The offset site will be managed for the conservation of GSM.

From the commencement of the approved OMP and conservation agreement, the landowner agrees to undertake the following management commitments in perpetuity:

- Maintain the condition of the site (for weeds, pest animals) at the level achieved by Year 10.
- Retaining all standing trees, dead or alive.
- Retaining fallen logs and fallen branches.
- Exclude stock except as otherwise specified under this approved plan.
- Exclude the use of stock feed such as hay or other material which could introduce weed seeds that is sourced from outside the offset area. Sterile feed such as pellets may be sourced externally;
- Exclude pasture improvement (but not ground cover rehabilitation to increase the cover of native grasses and herbs), and cultivation for commercial cropping;
- Exclude fertilizer application.

3.8 Risk assessment and adaptive management

Active ecological management is expected to provide a high probability of generating improvements in the condition of the vegetation present (i.e. increasing the abundance of native grasses and herbs while decreasing the abundance of introduced species) and attainment of the offset completion criteria. Note however, that the extent of this offset has conservatively been based on the assumption that management

will, at a minimum, improve the condition of GSM habitat present so as to be dominated by moderate quality native vegetation (VQA site condition score 31-45/75) including between 20% and 40% cover known food source with limited inter-tussock space (<5%) (note that a greater cover of inter-tussock space is targeted).

The management actions proposed in this plan are based on a combination of experience in the management of native grasslands and grassy woodlands, documents prepared by DEECA (i.e. DSE 2009) and other publications (i.e. Marshall 2013, Williams et al. 2015).

The proposed strategies for the management of this site are consistent with established practices for the management of grasslands and grassy woodlands elsewhere including State conservation reserves and offset sites.

The active involvement of TfN is also expected to provide high quality guidance and advice to the landholder in their management of the site.

The monitoring protocols documented in this plan are considered adequate to detect attainment of the offset completion criteria (above).

The plan includes a basic strategy (pulse grazing) for ground-cover biomass control which is considered a major ecological management requirement for the site. Where this fails to deliver the prescribed outcome in any one year, ecological burning provides an option to achieve the required biomass management target (i.e. maintaining an open grassy ground cover dominated by native species in a gradually regenerating open woodland environment). The application of one or both of these management actions will provide the biomass control outcome required.

It is acknowledged that the response of natural environments to management can be unpredictable and location dependant and therefore management activities need to be flexible to respond to changing conditions and unpredictable events. Examples of potential risks are outlined in Table 7 and discussed below. Seasonal conditions can also vary greatly from year to year and influence offset site management actions in any one year. This seasonality is recognised in this offset plan by allowing for flexibility around timing of actions at the discretion of the land manager in consultation with TfN so as to attain and maintain performance and completion criteria.

There is some risk that biomass control is not properly managed in any one year. This has the potential to occur in response to above average rainfall years when ground cover growth is persistently high and wet conditions restrict stock access and the potential use of ecological burning. If such events occur, the land manager will ensure additional efforts are made by in subsequent years to maintain the rate of improvement required.

Another major ecological management requirement is weed control, with the objective of reducing the overall presence of weeds and reducing biomass. Varying seasonal conditions will provide triggers for changes in the abundance of different species, particularly weeds. The greatest risk to achieving the required outcomes is a failure to conduct an appropriate level of work at an appropriate time or the occurrence of persistent adverse conditions restricting an appropriate management response. The regular site inspections will allow land managers to anticipate changes in seasonal conditions and respond accordingly. Persistent, well timed management actions at an appropriate intensity will be able to take advantage of seasonal fluctuations to achieve the completion criteria.

Woody weeds in particular are currently only present at low levels within the offset site and it will be a relatively simple management exercise to eliminate these species and maintain their absence. While woody weeds will potentially colonise the site from near-by infestations, seedlings will be detected through monitoring and controlled by the proposed on-going works. If live, woody weeds are detected in the offset area beyond Year 2 of the plan corrective actions would be required (e.g. increase woody weed control activities to ensure elimination of these species within one year).

Similarly control works will target perennial weeds including Brown-top Bent and any others observed. Persistent herbicide application is an effective control measure for these species and while these species are likely to reinvade from surrounding infestations, ongoing works are planned to cope with the associated management requirements. If adequate resources are not allocated to these tasks, the cover of these species may remain static or increase. Any observations or monitoring which detect an increase in perennial weeds above the previous assessed conditions and percentage cover will trigger a requirement for a greater management input (the required corrective action being targeted increased management actions). In that context additional site observations (over and above formal monitoring) collected by TfN (or an independent ecologist) is essential in providing feedback on the efficacy of management.

Another significant risk associated with the management of this site is the occurrence of climatic triggers which would increase the abundance of weed species by triggering the germination of any soil stored seed reserves. In the first instance management will over allocate resources to weed control. However, as a more comprehensive level of weed control is achieved by such works the lower the ability these weed species will have to recover / recolonise. Integrating herbicide control works with biomass control works (grazing and/or fire) increases the efficacy of both actions and the outcomes-based approach to this plan (i.e. to attain and maintain the offset completion criteria) supports this approach. Given persistent management occurs it is considered a relatively low risk that the completion criteria will not be achieved.

If after the first 6 years of management, the monitoring results indicate that the completion criteria are unlikely to be achieved, DCCEEW will be contacted to determine potential additional future offset requirements. This will be reviewed again after Year 8. If the offset area fails to attain and maintain the completion criteria at or following year 10, but during the period of EPBC Act Approval, an additional offset will be provided by ABP to account for the failed offset. DCCEEW will be consulted to determine the suitability of the replacement offset. The Year 6 and 8 review is the responsibility of ABP.

Active management to target the control of pest plants and to manage the accumulation of ground-cover biomass is advantageous to both the health of a grassy woodland but also to the ability of GSM to persist within this environment. As such the proposed management regime is considered unlikely to have a negative impact on GSM. This has been our experience where Biosis has managed other grassy reserves in metropolitan Melbourne. If the GSM monitoring detects significantly fewer GSM observations (i.e. a decline of over 50%) in successive monitoring events potential causes for such a decline would be investigated and appropriate corrective actions implemented. Such an outcome resulting from the implementation of this OMP is considered highly unlikely (i.e. low risk).

This OMP describes management and monitoring actions at the offset site for the 10 year period following commencement of the OMP. At the end of that period management and monitoring actions will be reviewed in light of the new condition of the offset and any new information relating to the management of this type of grassy woodland environment. Note that active conservation management is required in perpetuity with the quality of the vegetation to be maintained in perpetuity at the condition attained 10 years after the TfN deed of covenant is registered on title. The timing of actions is based on adaptive management. By monitoring management actions, and habitat condition, management will be adapted to ensure the stated commitments in the OMP are achieved. Also over time, new management techniques may become available, or further information on the ecology and status of the vegetation communities onsite may necessitate adjustment to management actions. The landowner will continue to receive advice from TfN on any developments in grassy woodland management and update the OMP as appropriate in perpetuity.

Section 4 includes tables of management actions (Table 6) and a risk assessment (Table 7) with associated monitoring (Table 8) and reporting (Table 9) programs.

Key risks identified in Table 7 include:

- Unauthorised entry of domestic stock or vehicles into the offset area;

- Woody weed infestations;
- Failure to detect and control new infestations, as well as failure to reduce existing infestations;
- Failure to increase the species composition and density of perennial native grasses;
- Rabbit infestations;
- Over abundant tree regeneration; and
- An unexplainable decline in the abundance of GSM.

Failure of the adaptive management approach to adequately respond to risks, as identified in monitoring reports (Section 3.11) or audits (Section 3.12), will result in a review of this plan, as discussed in Section 3.13.

3.9 Management actions and land use commitments

This section outlines the actions required to achieve the completion criteria by Year 10. The offset site is to be secured and managed for conservation purposes in perpetuity. Management actions described below are to be implemented for a period of 10 years. The OMP will be revised after the end of the initial ten year period to ensure it remains appropriate for maintaining the completion criteria. The revised OMP will continue to apply to the land and the landowner will continue to manage the offset site after the completion of year 10 as specified under the covenant. Formal reporting to DCCEE will be required for 10 years after commencement of the OMP. However, the Minister maintains an interest in the site until the end of the EPBC Act approval period (1 August 2038) and can request ABP to conduct an audit at any time during that period. Beyond the first 10 years the offset will be managed for conservation in line with the TfN covenant in perpetuity.

The broad objective of site management will be to produce a decrease in the abundance of perennial weeds with a commensurate increase in the abundance of perennial native species, particularly grasses which are known food plants for GSM.

Offsets will be achieved by:

- Weed control:
 - Ensuring that weed cover declines continuously (note the baseline weed cover will be determined by the baseline monitoring event).
 - Ensuring that the cover of introduced perennial grasses (initially estimated at 40%) decreases by 50% of the baseline monitoring cover (this will at least improve the Lack of Weeds score).
 - Eliminating all woody weeds.
 - Monitoring for any new and emerging weeds and eliminate.
- Limiting organic litter and biomass accumulation.
- Monitoring the regeneration of eucalypts and conducting ecological thinning as required to prevent the formation of a dense sward of young regrowth. The maximum density will be one tree per 5000 square metres (average per definable offset management unit (paddocks or land parcels)).
- Controlling rabbits, hares and foxes.
- Monitoring and controlling new and emerging pest animals.
- Retaining all standing trees, dead or alive.
- Retaining fallen logs and fallen branches.
- Excluding stock except as otherwise prescribed by this plan.

The management actions listed below outline the prescribed actions for achieving the required gains through active management (maintenance and improvement) and permanent protection of the offset site. Table 6 specifies these prescribed actions and the timing for implementation. These actions will be applied to the entire offset area as identified in Figure 4.

Prior to works being undertaken each year an annual works program (based on Table 6) will be developed by an experience bushland regenerator. The person undertaking the works will prepare a detailed works program in consultation with TfN. The works program for the coming year will also address issues that may not have been anticipated in formulating this original management plan. The OMP will be updated as required with any revised versions of the OMP to be submitted to the DCCEEW for approval.

3.9.1 Fencing

Threats, including stock grazing must be able to be managed within the offset area at all times. Unauthorised access must also be prevented, particularly access via vehicle for unauthorised firewood collection. Preventing access will also minimise soil disturbance, soil compaction and the import of weeds and pathogens. The intention of fencing is to protect the property from threats in perpetuity.

The property boundary is currently fenced and its relative isolation currently controls access and threats effectively. There is no requirement to provide additional fencing for the offset area, as it is located within a fully fenced property.

Monitoring of access and threats will be conducted on an ongoing basis with fencing repaired or upgraded as required to control threats.

Posts or ground markers marking the boundary of the offset site will be set up to clearly identify the area for monitoring and management purposes. Markers will be located in accordance with advice from a qualified ecologist to ensure impacts to native vegetation are avoided. The offset boundary will also be marked in GPS mapping applications.

If existing land-use rights are to be fully exercised in the remainder of the broader parcel, fencing to control stock access to the offset site will be required. Fencing will meet the minimum standard set by DEECA's fencing standards (DEECA 2023) to establish a sturdy stock proof fence. If rabbit populations impacting the site cannot be controlled to an adequate level (based on advice from TfN) then fencing protecting the offset site will be upgraded to a rabbit proof standard.

The landowner will ensure all fencing around the perimeter of the property is maintained in good condition according to the standards detailed in DEECA 2023, for the term of the EPBC Act approval and as otherwise required in perpetuity by the TfN covenant.

3.9.2 Woody weeds

Elimination of all woody weeds

Woody weeds present and otherwise known from the local area include Sweet Briar *Rosa rubiginosa*, Gorse *Ulex europaeus*, Blackberry *Rubus anglocandicans* and Horehound *Marrubium vulgare*. The few woody weeds present throughout the offset site will be controlled within the first year of the OMP commencement date. Any woody weed recruits subsequently observed within the offset site will have their location recorded and plants subject to control works within 6 months of observation. No woody weeds will be permitted to set seed and will be controlled before any viable seed can be produced.

Any other woody weeds recorded on site must be eliminated appropriately. Any impact to Indigenous plants will be minimised during treatment of woody weeds. Woody weeds will be controlled by either cut and paint techniques, spot spraying or be hand pulled). Monitor for any re-sprouting or seedlings and eradicate.

New and emerging woody weeds

Monitoring for new and emerging woody weeds will be conducted throughout the year for the term of the agreement, and any new and emerging woody weeds eliminated (DEECA 2023).

3.9.3 Herbaceous weeds

Control of all herbaceous weeds

The Catchment and Land Protection Act 1994 (CaLP Act) lists noxious weeds and requires that all landowners take reasonable steps to prevent the spread of, eradicate and / or control noxious weeds on their land.

The control of high threat and listed noxious weed species is a key management action within the offset site and must be adequately addressed if improvement site gains are to be achieved.

The initial cover of weeds will be determined by a baseline survey. All weeds will be treated, with an emphasis on ensuring that weed cover does not increase beyond current levels (to be determined by the baseline survey). Weeds listed in Table 5 were found on site and are considered to be a high threat. These weeds will be monitored each year to ensure their cover is not increasing. Increasing cover of these weeds will be controlled using the methods outlined in Table 5 or as otherwise approved by TfN.

Treat weeds before the plant has flowered and set seed. Impacts to indigenous plants will be minimised during treatment.

Relatively flat areas with a low erosion risk can be treated more intensively than areas on slopes which are more erosion prone. Refer to DEECA (2023).

New and emerging herbaceous weeds

Monitoring for new and emerging herbaceous weeds will be conducted throughout the year for the term of the agreement, and any new and emerging weeds eliminated. In addition to any high threat weeds, this must include any noxious weeds listed under the CaLP Act.

3.9.4 Pest animals

The Catchment and Land Protection Act 1994 lists rabbits, hares 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 hares will be monitored and controlled throughout the year. If rabbit activity is detected on the site the landowner will implement a comprehensive control strategy in accordance with DEECA (2023). This involves fumigation, hand collapsing of burrows and baiting. Carcasses will be removed to prevent poisoning of native predators.

Foxes are a threat to native fauna and will be controlled if found on the property. Fox dens where present are required to be destroyed through fumigation and hand collapse.

Any observations of pest animals within the offset site during other activities will be recorded. Pest animals will be formally monitored annually in November through the conduct of spotlight transects across the offset site. This is expected to require about 1 hour of walking / driving across the site. This assessment of the presence and abundance of each pest species will be included in the annual report. Control works will ensure that the abundance of any pest species is maintained at low to negligible levels.

Active control works targeting pest animals are not expected to have any negative impact on GSM located at the offset site. The landowner will monitor and control rabbits, hares and foxes all year round as well as any new and emerging pest animals.

Table 5 Herbaceous weeds to be controlled – method and timing

Scientific name	Common name	Method	Timing
<i>Acetosella vulgaris</i>	Sheep Sorrel	Spot spray with an appropriate herbicide.	Late winter to early summer
<i>Agrostis capillaris</i>	Brown-top Bent	Crash graze, spot spray with an appropriate herbicide.	Late winter to early summer
<i>Arctotheca calendula</i>	Cape Weed	Spot spray infestations with an appropriate herbicide.	Late winter to early summer
<i>Avena</i> spp.	Oats	Crash graze, spot spray with an appropriate herbicide.	Late winter to early summer
<i>Bromus</i> spp., <i>Vulpia</i> spp., <i>Aira</i> spp., <i>Cynosurus</i> spp.	Weedy annual grasses	Crash graze, spot spray with an appropriate herbicide.	Late winter to early summer
<i>Cirsium vulgare</i>	Spear Thistle	Chip out or spot spray rosettes with an appropriate herbicide.	Late winter to early summer
<i>Disa bracteata</i>	South African Orchid	Dig out and remove from site. Spot spray with an appropriate herbicide.	Late winter to early summer
<i>Erodium</i> spp.	Heron's-bill	Spot spray with an appropriate herbicide.	Late winter to early summer
<i>Holcus lanatus</i>	Yorkshire Fog	Spot spray with an appropriate herbicide.	Late winter to early summer
<i>Hypochaeris radicata</i>	Flatweed	Spot spray with herbicide as appropriate.	Late winter to early summer
<i>Lolium</i> spp.	Rye-grass species	Crash graze, spot spray with an appropriate herbicide.	Winter to Spring
<i>Trifolium</i> spp.	Clover	Crash graze, spot spray with an appropriate herbicide.	Late winter to early summer

3.9.5 Biomass / Organic Litter control

Biomass management throughout the offset site is essential to maintain the open tussock grassy ground cover structure preferred by GSM. While there are no specific guidelines for habitat management for GSM within the relevant conservation advice for GSM, habitat degradation of grassland and grassy woodland environments is a known threat for the species.

Where there is a sustained build up in ground cover biomass over any one year, resulting in a reduction of inter-tussock space to an average of less than 20%, biomass will need to be actively reduced. Site productivity is a key determinant of ecosystem responses to disturbance regimes and in productive systems frequent disturbance (i.e. 1 to 5 year intervals) are commonly required to maintain diversity. This is because potentially dominant species, predominantly grasses, can rapidly re-establish between disturbances causing the sub-dominant inter-tussock species to be outcompeted (Morgan 2015).

Judgements on the cover of inter-tussock space and the build-up of groundcover biomass will be made by the landowner in consultation with the TfN and include an assessment of relevant monitoring data. Biomass accumulation will be measured using the 'Golf Ball Method' (Morgan 2015) with measurements of high biomass accumulation requiring a management response. The independent ecological monitoring undertaken by a suitably qualified ecologist will also assess the effectiveness of the biomass control techniques applied and the need for any adjustments to the management regime to achieve or maintain the completion criteria.

Controlled grazing will be applied to reduce biomass and maintain an open tussock-grass structure for this grassy ground cover. If appropriate, ecological burning will be utilised.

Use of grazing for ecological management

Currently the offset site is subject to unrestricted grazing by sheep. Given the diversity of native species found within the uncultivated sections of this site, this method of disturbance (grazing by domestic stock) is seen as a reliable and conservative action to maintain the ecological values associated with the area. While grazing by domestic stock will continue as a method of biomass reduction at this site, it will be undertaken in a controlled manner as outlined in this OMP. Biomass accumulation control at this site will therefore be in accordance with the standards for management of ecological grazing published by DSE (2009).

The offset site supports patches of native grassy understorey but in general does not support enough indigenous ground cover to be uniformly defined as native vegetation (DELWP 2017). Timed grazing in the offset area to maintain an open tussock grassland structure is seen as a precautionary management method to disadvantage introduced annual and perennial grasses and provide an advantage to native perennial grasses. Grazing of domestic stock will utilise sheep.

Grazing by other domestic stock including but not restricted to cattle, goats and horses will be excluded from the offset site by this plan and the conservation covenant.

The timing of grazing will be controlled to allow native species to grow and set seed over the spring to mid-summer period (DSE 2009). Stock will be excluded or only occur at very low levels (i.e. less than 20% of recommended stocking rates) from the beginning of October to the end of December annually, for the life of the OMP. However, this period will be flexible to reflect the prevailing climatic conditions and allow the period of grazing exclusion to be varied on ecological advice. The landowner will keep records of the number of stock, timing and duration of grazing within the offset area. This data will be provided to the TfN on an annual basis as part of the Landholder monitoring and reporting process. This data and the resultant impact on biomass will provide the basis for an on-going grazing strategy to be approved by the TfN or an independent ecologist approved by the TfN.

The only exception to requirements specified for the control of grazing is if an ecological burn is planned and occurs during the grazing period. In this instance a fire management plan produced by the landholder in consultation with TfN will inform when grazing will be removed to allow for a build-up in biomass to establish post-fire.

Note that the objective of grazing is to maintain an open tussock ground cover structure and to allow native perennial grasses to set seed and increase their abundance over time, in order to attain and maintain the offset completion criteria.

Use of fire for ecological management

Burning within the offset area will be undertaken only with due consideration to relevant health and safety issues, in consultation with the Country Fire Authority and in line with a fire management plan completed by a suitably qualified consultant. The following provides guidelines for use of burning only in an ecological sense.

While grazing by domestic stock will be the typical manner in which ground cover biomass will be regulated, the controlled application of fire is an efficient and cost-effective alternative technique for reducing biomass in grassy ecosystems such as those that occur within the offset site. Importantly, burning (compared to grazing or slashing) allows greater access and efficiency for weed control and increased natural regeneration of indigenous plant species. While burning may enhance germination of indigenous species, it can also be expected to promote certain exotic species and as such post-burning weed control will be vital to effective weed control. However, stimulating the soil-stored weed seed bank is seen as positive as this allows this seed bank to be exhausted through active management.

Burning is acknowledged as an important component of the natural disturbance regime in grassy ecosystems but because of the habitat requirements for GSM burning will be restricted to outside the GSM flight season (generally November to January in Victoria). This allows management to be consistent with the relevant conservation advice.

The controlled application of fire will be used for biomass reduction in all or parts of the offset site. Selected areas of grassland may be burnt to tackle particular weed issues or to assist in the lowering of soil nitrogen and phosphorous which would also assist in weed control works. However, no portion of the offset area is to be burnt more frequently than once every three years (unless approved by TfN in consultation with a qualified ecologist). Burning will be conducted in a mosaic pattern and any individual burn will not burn the entire site.

The landowner will prepare maps identifying the fire history of the offset area to ensure biomass control efforts are at appropriate frequencies and recorded. Details of fire and grazing within the offset will also be documented in the annual reporting as outlined in Section 3.11.

Any ecological burns will be conducted during benign (nil to low wind and mild temperature) weather conditions and are likely to be patchy (i.e. not result in the uniform burning of all areas). Patch burning will ensure an array of small patches are burnt covering no more than about a hectare for any burnt patch. This will be mapped by GPS to ensure appropriate tracking of management actions.

No portion of the offset site will be burnt at a frequency of more than three times over any decade covered by this OMP. This is considered a low fire frequency for the management of grassy ecosystems.

Any burning strategy will minimise impacts to GSM and the potential for fire to spread in an uncontrolled manner. Ecological burning will only occur outside the prescribed declared fire danger period for this region.

Burnt areas will be protected from grazing for at least 6 months immediately following the burn to allow species regeneration and recruitment to occur. Vegetation cover of above 60% is required before grazing can be re-introduced.

3.10 Monitoring

3.10.1 Baseline Site Condition

While the condition of the broader area of the offset site is documented by Biosis (2023), details of the specific matters relating to the selected offset area of 7 hectares will be established by the collection of baseline condition data. These data will provide the baseline information for future comparisons and assessments to define the efficacy and progress of the management of the offset site to achieve the completion criteria.

During the first spring after the approval of this OMP and prior to the commencement of any management activities a suitably experienced botanist will systematically survey the site and collect information on the flora species (native and introduced) present and maintain a complete list of all vascular species observed. Notes will be taken on the distribution and location of weed species with GPS waypoints recorded to provide detailed information on the location, extent, and severity of target pest plant infestations. This information will be mapped to provide a guide to both management activities and allow a visual assessment of management progress over the life of the plan. The survey report will be provided to the landowner and TfN.

GPS locations will be recorded and mapped to identify the location of any threatened species observed and the location of any other survey and monitoring infrastructure (i.e. photo points and monitoring quadrats).

A minimum of five permanent five by five metre monitoring quadrats will be established within the offset site, having regard for the size, nature and variability of management zones (paddocks). The minimum of five plots was selected on the basis of the extent of the site, the topographic variation present (upper, mid and lower slopes, ridgetops and valley floors) and the variations in site conditions (across a spectrum of weed dominated to predominantly native).

These locations will be defined during the baseline site inspection prior to the commencement of other management works and will be representative of the offset site. They will be evenly distributed across the site and if considered appropriate, additional monitoring sites can be included. Quadrats will be clearly marked and accurately located by GPS or similar within the offset site. These quadrats will be used to assess and record the percentage total vegetation cover, the percentage cover of inter-tussock spaces, the average height of vegetation and the cover of native and exotic life-forms. These areas will also include the collection of biomass data using the golf ball method (Morgan 2015). These data will be collated, in conjunction with the observations made on herbaceous and woody weeds collected during the systematic site assessment survey and be used to report on the baseline condition of the offset site. Ongoing monitoring will then assess progress in the management of weeds (including grasses) and biomass over the entire offset site. Ongoing use of the established monitoring plots will continue if this information is required to evaluate ongoing compliance with the completion criteria.

All of the permanent vegetation monitoring quadrats established by the botanist will also serve as permanent photo points. Photo points will be located to adequately characterise the current vegetation condition. Using a selected marker point for the vegetation monitoring quadrat, a photo will be taken facing the four points of the compass (N, S, E & W). These baseline photos will be used to provide a visual document and for monitoring the vegetation response to management.

The average level of open inter-tussock spaces (as determined by the 5 monitoring plots) will be taken as the average open space available across the offset site unless the broad observations taken during the annual vegetation monitoring indicate this result is atypical.

Improving the abundance and cover of native grasses, particularly GSM food plants, identified in the baseline vegetation condition assessment will be taken as improving the relevant food resources for GSM. The abundance of these plant genera will be measured in the five monitoring plots established for vegetation condition monitoring. Improving these levels will be taken as the improvement of food resources for GSM. A 25% reduction in the cover of these species will be taken as a trigger for corrective management action.

The cover of weeds will be measured in the baseline vegetation condition assessment, in the five monitoring plots established for vegetation condition monitoring. The baseline cover of total weeds and cover of introduced perennial grasses (initially estimated at 40%) will be documented in the first annual report. This will establish the numeric target for the introduced perennial grass reduction target of 50% (Table 6).

Baseline data will be documented in the first annual report and form the basis of evaluating the ongoing efficacy of the management actions conducted. As the proposed targets relate to the initial condition determined by the baseline monitoring, the baseline data will influence both the intensity and frequency of management actions required to achieve the stated targets.

3.10.2 Continuous monitoring

Monitoring of the site is an integral component of the regular site management activities. Such monitoring identifies changes early, allowing an appropriate and timely management response to matters which would otherwise undermine the objectives of the OMP. This includes observations by the landowner during normal activities within the offset site and broader property. Such observations are important for maintaining things such as the integrity of fencing and site security. While these are normal land management activities they have also been formalised in this OMP (See Table 6).

Regular site inspections (of about three to five hours at least every two months) to provide general condition observations are also a requirement of this plan (See Table 8). At a minimum the landowner must keep a diary of any works conducted within the offset site and record any observations which could influence or initiate a management response (e.g. “observed seedlings of a new woody weed in the middle of the offset site today. Will spot spray these with an appropriate herbicide by the end of the week”). These details provide valuable information on the management of the site and detail the commitment of the landowner to the OMP.

More general supervision/monitoring of the offset site will be undertaken by the TfN to ensure the grassy ground cover response to management actions achieve the offset completion criteria. TfN will undertake site inspections four times over the initial ten year offset period. Additional site visits may be requested by the landowner. TfN will also provide advice which may inform the works plan, on the request of the landowner or a consultant/ land manager.

The progress of management works will be inspected by the landowner on a regular basis (at a minimum once every two months). The landowner will provide a management progress report to TfN on an annual basis (or more frequently as required). Records of all management actions will be kept to provide evidence of completed works and management tasks.

A list of plant species observed, noting which, if any, weed species have become locally extinct will be maintained for the offset site by the landowner. While all data collection will be the responsibility of the landowner, all data collected will be provided to DCCEEW on request.

Annual vegetation monitoring assessments conducted by suitably qualified ecologists will include a broad assessment of the entire offset site to document the general overall condition of the site and the ability of management works to attain and maintain the OMPs completion criteria).

3.10.3 Fence condition

Surveys of the property boundary fence will be conducted quarterly, and when visiting the site to conduct other monitoring or management actions. Any damage to the fence that may allow vehicles or stock to enter outside of the parameters outlined in this OMP will be repaired within seven days.

3.10.4 Weed monitoring

Weed monitoring will be conducted annually in spring (September – November). There will be three components to the monitoring:

- Inspection of the entire offset area for woody weeds, by walking and / or driving throughout the area such that a visual inspection (including with binoculars) would detect the presence of any woody weeds. Complete coverage of the offset site will likely require at least four hours of survey. All patches of infestations or individual plants will be mapped with a GPS, and the locations will be supplied to the weed management contractor/landholder for treatment. Subsequent monitoring will then revisit previously mapped infestations to evaluate the success of weed control, as well as inspecting the entire offset site for new infestations.
- While conducting the woody weed surveys, notes will be taken regarding the cover of herbaceous weed species, and cover will be estimated to the nearest five percent cover. Species and areas suitable for targeted treatment (such as spot spraying), will be mapped and supplied to the weed management contractor/landholder for treatment.

- Five, five by five metre quadrats will be established in selected locations across the offset site. Each monitoring quadrat will be representative of the management unit identified for that portion of the offset site. These quadrats will be used to assess and record the percentage total vegetation cover, the percentage cover of inter-tussock spaces, the average height of vegetation and the cover of native and exotic life-forms. These data will be collated and, in conjunction with the observations made on herbaceous weeds collected in association with woody weed monitoring, used to report on progress in attaining offset completion criteria.
- The permanent vegetation monitoring quadrats will also serve as permanent photo points. Photo points will be located to adequately characterise the current vegetation condition, and include a range of weed species. Using a selected marker point for the vegetation monitoring quadrat, a photo will be taken facing the four points of the compass (N, S, E & W).

3.10.5 Pest animal monitoring

Signs of pest animals (rabbits, hares and foxes) will be recorded during weed monitoring surveys, and at all other times when visiting the offset site. In particular, the locations of any active rabbit warrens will be mapped using GPS, and the locations supplied to the pest animal management contractor/landholder for treatment. Subsequent monitoring will then revisit previously mapped warrens to check for on-going use, as well as searching for new warrens throughout the offset area.

3.10.6 Tree and shrub monitoring

A dense cover of tree and / or shrub recruitment would reduce the overall suitability of the GSM habitat. While grazing would likely limit the establishment of woody native species, there is some potential for dense stands of woody native species to develop as a result of changed management activities.

Tree and shrub recruitment within 10 metres of an identifiable drainage line on moderate to steep slopes will be encouraged. This will also provide greater landscape resilience to erosion. However at a broader scale, the regeneration of woody native species (trees and shrubs) may need to be controlled to prevent it becoming a dominant feature of the offset area.

An open cover of tree regeneration is considered desirable as it is likely that an open woodland was the natural condition of this environment and allows both the structure and species composition of GSM habitat to be maintained. In that context an initial density for tree regeneration, beyond any regeneration along defined drainage lines, be restricted to one tree for every 5000 square metres. If monitoring indicates that no tree regeneration is able to cope with the grazing regime applied to the offset site then selected tree regeneration may be protected with localised fencing to prevent browsing by domestic stock. If shrub regeneration is assessed as problematic, an appropriate control plan would be implemented to reduce the density of shrubs to acceptable levels (i.e. 1 shrub per 1000 square metres).

3.10.7 Golden Sun Moth Monitoring

Monitoring during the flight season for GSM is considered essential for DCCEW to be satisfied as to the continued suitability of the site and its management as an offset for impacts to GSM. Baseline information for the population of GSM within the offset site is based on Hamilton Environmental Services (2020). Monitoring will record the location and number of individuals observed along monitoring transects as described by Hamilton Environmental Services (2020).

As the species is known to occur at the offset site no reference site is required for monitoring the population of GSM. However, prior to surveys being conducted, reports of GSM flying in or around Melbourne are likely to provide a useful indicator to identify the start of the flight season around Glenhope.

Monitoring for GSM will occur during the annual flight season. Repeated monitoring of the transects will occur in Years 2, 4, 6, 8, and 10 (Table 8) to evaluate the persistence and relative abundance of Golden Sun Moth at this site.

A monitoring event includes four GSM surveys (i.e. the site is assessed four times during a flight season) to document the occurrence and abundance of GSM within the offset site. The results of these surveys will be compared to the original baseline surveys (2020/21 flight season) and those of the previous monitoring event. Surveys will be conducted biennially for the first ten year period of this OMP. Surveys will be undertaken during the GSM flight season, which in this region is expected to be between October and December. As the timing of the flight season varies annually and geographically, surveys will be initiated from when warm weather is considered likely to stimulate emergence. In this region this is expected to occur anytime from early October onwards. Any observations of GSM during monitoring for vegetation condition and during inspections by the landowner or TfN will be recorded and reported.

Surveys within the flight season are to be spaced at least one week apart to allow for variations in emergence patterns. Surveys will take place when conditions are suitable for male flight (generally >20°C, bright, clear days, full sun, absence of rain and wind other than a light breeze) between 10:00 hrs and 15:00 hrs.

During each survey, two suitably qualified ecologists will systematically walk over the entire offset site separated by about 100 metres recording all individuals observed within approximately 10 metres of their transect line. Each pair of transects will then be separated by another 100 metres and be located to cover all sections of the offset site. The beginning and end of each transect will be recorded as a GPS waypoint. Tracks will be recorded using a GPS and a waypoint taken for each location where GSM are observed. Each transect is expected to take between 20 to 30 minutes to complete.

Any obvious changes to the habitat characteristics of the offset area will be recorded during the GSM survey. This will be supported by relevant photos of the habitat or management issues identified.

The results of each survey will be reported to TfN and DCCEEW. The report will also include an assessment of any changes or trends noted in either the habitat condition or number of GSM observed noted by the ecologist.

3.11 Reporting

This OMP requires the landowner to submit a report to TfN and ABP annually for each year of the 10 years of the management plan. Reports are to be submitted prior to the anniversary date of the covenant registration on title. ABP will also publish these reports on its website within three months of every 12 month anniversary.

The Annual Report will address progress against the commitments set out in this OMP. Annual Reports will provide enough detail in the form of written comments and supporting evidence that an assessor can easily determine the completion of/progress against the management commitments and completion criteria for the offset site.

The annual report must include:

- Details of management actions, including on ground works, undertaken within the reporting period.
- Results of monitoring activities, including fence condition, weeds, pest animals, habitat quality, vegetation quality and ground cover biomass accumulation / the cover of open ground.
- Tracking and evaluation of results in comparison to management performance targets and completion criteria
- Site photographs including from five defined photo points.
- Details of compliance or non-compliance with the schedule of management actions (Table 6).
- Details of compliance or non-compliance with performance targets (Section 3.5.2).

- Details of any incidents or new and emerging management issues, with recommendations for corrective action and plan review in order to attain the offset completion criteria.
- Any triggers exceeded and which corrective actions were implemented
- Details of any GSM monitoring events including an assessment of the relevant results.

The reporting schedule is detailed in Table 9.

3.12 Auditing

The approval holder (ABP) is responsible for auditing the implementation and effectiveness of the OMP.

Audits will be conducted by an independent ecologist at the following stages:

- At the end of the first year of site management - this is to ensure that initial management and monitoring actions are conducted to the satisfaction of the approval holder and DCCEEW, including implementing the legal security mechanism, ensuring the property is securely fenced, and that other initial management and baseline monitoring actions have commenced.
- At the end of the fourth year of site management – this will involve a review of four annual monitoring and management reports, as well as an independent assessment of the condition of GSM habitat within the site.
- At the end of the eighth year of site management – as per the four year audit.
- Following the completion of the 10th year – to be an audit of the implementation and effectiveness of this OMP.

The timing of scheduled audits is detailed in Table 9. Additional audits may be triggered as a result of a plan review (Section 3.13) or following an environmental incident resulting in significant change to site conditions, as identified in the risk assessment (Table 7).

3.13 Plan review

This plan includes an adaptive management framework, where management actions may be triggered by events occurring within the offset site, or the results of monitoring activities. A review of the OMP will only be necessary in the event of a major incident that makes a significant change to the character or condition of the offset area. The most likely such event is a major wildfire, as described in Table 7.

If a plan review is triggered, this will be conducted by ABP in consultation with the offset site owner, TfN and DCCEEW. Any future adaptive management changes will be incorporated into the OMP and an updated version of the OMP will be supplied to DCCEEW for approval. Any approved revised plan will be provided to TfN.

The OMP review will involve changes to any part of the OMP, in order to adequately respond to the trigger and re-direct management actions towards achieving the environmental outcomes under potentially altered site conditions.

This could involve changes to:

- Specific details of offset site management methods.
- Monitoring methodology.
- Schedules of monitoring, reporting and auditing.

4. Schedule of management actions, risks, monitoring and reporting

This section provides a schedule of management actions (Table 6) for the offset area. Table 7 provides an assessment of the risk of failing to achieve desired outcomes and specifies how this relates to the monitoring (Table 8) and reporting (Table 9) program.

Table 6 Management Actions

Year No	Objective – Entire offset site	Timing of activity – month(s)	Standard to be achieved	Related management and monitoring activity (# -see Table 8)
1 and all years following	1. Control of stock, unauthorised activities and vehicle access. Ensure the offset site is appropriately fenced from neighbouring land and road reserves. Fences to be monitored and maintained in functional condition.	Within 1 month of commencement of the OMP.	Control of domestic stock access to offset area. Exclusion of unauthorised vehicles from offset area. Exclusion of unauthorised access or unauthorised firewood collection. Maintain fencing around the perimeter of the property to the standard detailed by DEECA (2023). Any new fences, if required to control threats to ecological values, will be constructed to this standard.	Management Sec. 3.9.1 Monitoring #1 - Sec. 3.10.2 and 3.10.3
1 and all years following	2. Remove all woody weed infestations within the offset area Weeds to be managed in accordance with DEECA (2023) standards for weed management.	Within 1 month of commencement of the OMP.	No mature woody weeds present within offset area (<<1% cover) after the completion of Year 1. Minimise off-target damage (avoid all native plants). Record and control any woody weed regeneration / re-colonisation.	Management Sec. 3.9.2 Monitoring #2 - Sec. 3.10.2 and 3.10.4
All years	3. Reduce herbaceous weed covers. Control methods and timing specified in Table 4 and in accordance with DEECA (2023). Establish baseline monitoring sites including quadrats (5) and photo points (5) and reassess annually in late spring.	Refer to Table 4.	Herbaceous weed cover to not exceed current levels. Herbaceous weeds not to interfere with native grass recruitment. Minimise off-target damage (avoid all native plants). Introduced perennial grasses to reduce in cover by 50% at the end of 10 years management.	Management Sec. 3.9.3 Monitoring #2 - Sec. 3.10.2 and 3.10.4

Year No	Objective – Entire offset site	Timing of activity – month(s)	Standard to be achieved	Related management and monitoring activity (# -see Table 8)
All years	4. Prevent new and emerging woody weeds from establishing.	Ongoing	New outbreaks of woody weeds to be removed as soon as detected. No woody weeds present within offset area. Minimise off-target damage (avoid all native plants).	Management Sec. 3.9.2 Monitoring #2 - Sec. 3.10.2 and 3.10.4
All years	5. Manage ground cover biomass.	Ongoing	Minimise or exclude grazing from the beginning of October to the end of December annually. Note this period may be varied based on ecological advice. Allow native grasses to flower and set seed. Maintain an open tussock grassy ground cover with inter-tussock spaces covering about 20% (+/- 10%) during the GSM flight period.	Management Sec. 3.9.5 Monitoring #2 - Sec. 3.10.2
Years 2, 4, 6, 8 and 10	6. Maintain and enhance Golden Sun Moth population. Reassess baseline monitoring transects biennially during the GSM flight season. Report on population and habitat condition.	GSM flight season	Documentation of GSM population from the baseline transects established by Hamilton Environmental Services (2020) collected four times in each monitoring event. Assessment of any trends in GSM population size or extent. Documentation of the condition of GSM habitat condition based on visual assessments.	Management Sec. 3.10.7 Monitoring #2 - Sec. 3.10.2 and 3.10.7
All Years	7. Enhance Golden Sun Moth habitat condition. Utilise 5 quadrats used for weed monitoring and other general observations.	Late Spring (see Table 5)	Document the condition of GSM habitat based on the abundance of GSM food plants and inter-tussock spaces.	Management Sec. 3.10.1 Monitoring #6
Ongoing	8. Control Rabbits, Hares and Foxes. Rabbits to be managed in accordance with DEECA (2023).	Ongoing	No fresh ground disturbance by pest animals (particularly rabbits) observed in the offset area. No active rabbit warrens within offset area, minimal surface harbour for rabbits and hares present (but excluding natural harbour such as logs and rocks). No active fox dens within offset area, if present they are to be destroyed through fumigation and hand collapse. Continue to monitor and control rabbits and foxes all year round.	Management Sec. 3.9.4 Monitoring #3 - Sec. 3.10.5

Year No	Objective – Entire offset site	Timing of activity – month(s)	Standard to be achieved	Related management and monitoring activity (# -see Table 8)
Ongoing	9. Control all new and emerging pest animals.	Ongoing	Control numbers of any new and emerging pests.	Management Sec. 3.9.4 Monitoring #3 - Sec. 3.10.5
Annual	10. Control tree and shrub regeneration and undertake ecological thinning if required (section 3.10.6).	Autumn	Tree and shrub regeneration does not limit habitat for GSM. Maintain an open / scattered cover of immature canopy trees and understorey trees or large shrubs to a level of not greater than one tree and 10 shrubs per 5000 square metres. If cover levels of the relevant species exceed these limits then they will be thinned to achieve the designated target.	Management Sec. 3.9 Monitoring #4 - Sec. 3.10.6
All (annually)	11. Report on OMP implementation.	Submit 2 months prior to covenant registration anniversary date. Annual reporting under this OMP will be aligned with the reporting requirements of the TfN Agreement.	Annual report is signed, dated and submitted by the landholder at least 2 months prior to the anniversary date of the covenant registration, as specified in the TfN agreement.	Refer to section 3.11

Table 7 Risk assessment and management

This risk assessment uses the risk framework from the DCCEE EMP guidelines. The likelihood and consequence classification are summarised in Appendix 2.

Objective (refer to Table 6)	Event or circumstance	Likelihood	Consequence	Risk rating	Trigger	Contingency/s	Related monitoring activity (# See Table 8)
1	Unauthorised entry of domestic stock to the offset area. Grazing, browsing and trampling damage to vegetation. Damage to or loss of juvenile trees and shrubs.	Initial			Domestic stock sighted on offset site out of authorised periods.	- Remove stock within two weeks of being observed. - Repair fencing within 2 weeks of noting damage. - Monitor vegetation and report on any implications of this impact and the effectiveness of contingency measures in the annual report (i.e. additional / upgrade fencing requirements). Any recommendations will be implemented within 12 months.	1, 2 & 4
		Unlikely	Minor	Low			
		Residual (post-mitigation)					
		Unlikely	Minor	Low			
1	Entry of vehicles to offset area. Damage to understorey vegetation, soil compaction.	Initial			Vehicle observed on offset site. Evidence of recent vehicle access e.g. tyre tracks.	- Repair fencing within 2 weeks of noting damage. - Assess adequacy of fencing. - Document the implications of this impact and the effectiveness of contingency measures in the annual report (i.e. additional / upgrade fencing requirements). Any recommendations will be implemented within 12 months.	1
		Unlikely	Minor	Low			
		Residual (post-mitigation)					
		Unlikely	Minor	Low			
1	Unauthorised access.	Initial			Evidence of firewood collection or physical disturbance observed.	- Assess adequacy of fencing. - Document the implications of this impact and the effectiveness of contingency	1
		Unlikely	Minor	Low			

Objective (refer to Table 6)	Event or circumstance	Likelihood	Consequence	Risk rating	Trigger	Contingency/s	Related monitoring activity (# See Table 8)
2, 3, 4		Residual (post-mitigation)				measures in the annual report (i.e. additional / upgrade fencing requirements). Any recommendations will be implemented within 12 months.	
		Unlikely	Minor	Low			
	Woody weeds are identified within offset area. Herbaceous weed cover exceeds baseline levels.	Initial			Woody weeds are detected. Herbaceous weed cover exceeds baseline levels.	- Elevated weed control measures within the next suitable control season (i.e. normally within 6 months). Minimise off-target damage (avoid all native plants). - Control of the elevated risk is achieved within 12 months. - Increase weed monitoring to include late winter and spring monitoring to ensure control works are conducted at a suitable intensity. Maintain increased monitoring until this issue is resolved. - Report on additional monitoring and weed control works and the outcome of these activities in the annual report.	2
		Possible	Minor	Low			
		Residual (post-mitigation)					
		Unlikely	Minor	Low			
5 & 7	Native grasses fail to recolonise areas opened up by weed control works.	Initial			Areas subject to the control of perennial grassy weeds become dominated by annual weeds or bare ground.	- Review grazing strategy to allow native grasses to set seed during the following spring. - Harvest and disperse native grass seed to affected areas during the next available spring. - Increase site inspections in impacted areas to assess the efficacy of additional management	2 & 6
		Possible	Moderate	Medium			
		Residual (post-mitigation)					

Objective (refer to Table 6)	Event or circumstance	Likelihood	Consequence	Risk rating	Trigger	Contingency/s	Related monitoring activity (# See Table 8)
7, 8	Pest animals observed within offset site. Damage to understorey vegetation or recruiting trees and shrubs.	Unlikely	Moderate	Low	- Fresh ground disturbance or scats of pest animals observed in the offset area. - Active rabbit warrens observed within offset area. - Active fox dens observed within offset area. - New and emerging pest observed within offset area.	measures and document the outcome in the annual report.	3
		Initial					
		Possible	Moderate	Medium			
		Residual (post-mitigation)					
9	Tree and shrub recruitment is significantly above or below that allowed under this OMP.	Unlikely	Minor	Low	Cover of immature trees and shrubs are more than defined. Recruitment of immature trees and shrubs not observed.	- Ecological thinning to achieve target density of tree regeneration. This management action will be conducted within 6 months of the issue being identified and completed within 12 months of being initiated. - Where the lack of regeneration cannot be attributed to seasonal conditions, undertake management actions within 6 months to encourage regeneration and address threats to regeneration. - Any additional management actions will be clearly documented and included in the monitoring program. The efficacy of	4
		Initial					
		Possible	Minor	Low			
		Residual (post-mitigation)					

Objective (refer to Table 6)	Event or circumstance	Likelihood	Consequence	Risk rating	Trigger	Contingency/s	Related monitoring activity (# See Table 8)
		Unlikely	Minor	Low		additional works will be documented by appropriate seasonal monitoring and noted in the annual report.	
6	GSM population drops significantly without apparent reason.	Initial			Population of GSM declines by over 50% in comparison to any previous years without explanation as to how it may recover or habitat condition noted as significantly lower than previous year and recovery is uncertain.	- Review ecological management parameters within a month of identifying this issue. - Review this plan as appropriate within three months of identifying this issue. - Submit the revised plan to DCCEEW for approval within 4 weeks of redrafting.	5
		Possible	Critical	Severe			
		Residual (post-mitigation)					
		Possible	Critical	Severe			
1, 2, 3, 4, 5, 6, 7, 8	Wildfire or uncontrolled planned burn. May impact temporarily or permanently on overstorey condition and natural regeneration. May impact upon weed recruitment patterns. May destroy fencing.	Initial			Wildfire observed within offset area.	- Monitor for increased erosion (immediately post fire and for 12 months post fire). Implement erosion control measures within 4 weeks of identifying the need for any erosion control works. Complete the establishment of erosion control measures within 12 weeks. - Undertake weed control works during the first available seasonally appropriate conditions to take advantage of new growth.	1, 4
		Possible	High	Medium			

Objective (refer to Table 6)	Event or circumstance	Likelihood	Consequence	Risk rating	Trigger	Contingency/s	Related monitoring activity (# See Table 8)
3, 5, 7		Residual (post-mitigation)				- Inspect fence condition and repair any damage within the shortest plausible timeframe. - Significant wildfire throughout the majority of the offset area is a trigger for plan review (Section 3.13). - Document any additional works and their outcome in the annual report.	
		Possible	High	Medium			
	Year 6 review indicates that the offset site is unlikely to achieve completion criteria. Habitat condition and/or weed cover has not demonstrated improvement by Year 6 relative to baseline.	Initial			Year 6 review shows no measurable improvement in key indicators (e.g. inter tussock space, native grass cover) or no reduction in weed cover relative to baseline.	- Implement appropriate corrective actions immediately into management of the offset site (i.e. increased weed control effort, adjusted biomass management, targeted ecological management actions). - Document actions and outcomes in next annual report.	2, 4, 5
		Unlikely	Critical	High			
		Residual (post-mitigation)					

Objective (refer to Table 6)	Event or circumstance	Likelihood	Consequence	Risk rating	Trigger	Contingency/s	Related monitoring activity (# See Table 8)
		Unlikely	Critical	High			

Table 8 Monitoring schedule

#	Monitoring activity	Parameter/s measured	Survey / monitoring guidelines	Where	When	Reliability
1	Fence condition	Condition of boundary fences.	Survey the perimeter of the offset site to ensure fences are intact and assess evidence of domestic stock, vehicle access or firewood harvesting. Refer to Section 3.9.1 and 3.10.3 for details.	Offset site perimeter	Quarterly	High
2	Weed monitoring	Cover of woody and herbaceous weed species present.	Vegetation survey to be conducted to identify woody and herbaceous weed species and determine cover. Woody species to be mapped using GPS. Herbaceous weed cover (percentage cover) to be estimated for defined sections of the offset site. All weed species present identified to species level. Refer to Section 3.9.2, 3.9.3 and 3.10.4 for details.	Offset area.	Annual - Spring	High
3	Pest animal monitoring (Rabbits, Hares and Foxes, and new and emerging pest animals)	Presence of pest animals or signs e.g. scats, diggings, browsing or grazing	Signs of pest animals to be recorded during vegetation surveys. Locations of rabbit warrens to be mapped using GPS. Refer to Section 3.9.4 and 3.10.5 for details.	Offset area.	Annual – Spring During vegetation condition survey	High
4	Tree and shrub recruitment survey	Number of juvenile trees and shrubs	Tree and shrub species and size classes to be assessed within permanently marked quadrats. Refer to Section 3.9 and 3.10.6 for details.	Offset area.	Annual – Spring During vegetation condition survey	High
5	Golden Sun Moth population and habitat condition monitoring	Number of GSM observed. Subjective condition of habitat	Refer to Section 3.10.7 for details.	Offset area.	Years 2, 4, 6, 8, and 10	High

Table 9 Reporting schedule

#	Type of report	Approval condition	Responsibility	Timing	Reporting authority	Trigger (if any)
1	Annual management actions report. Tabulates management actions completed within the offset area (Section 3.11).	To be completed	Offset site owner	Report to be completed by August 31 so information is available prior to spring monitoring.	DCCEEW TfN	Not Applicable
2	Annual monitoring report. Presents results of offset site monitoring activities (Section 3.11).	To be completed	Offset site owner	Annual monitoring to be completed in spring. Report to be completed by November 30 of each year.	DCCEEW TfN	Completion of annual monitoring
3	Review of offset management plan (Section 3.13).	To be completed	Approval holder (ABP) and offset site owner	As required.	DCCEEW TfN	Significant environmental event causing widespread impact to habitat within the offset site e.g. Wildfire.
3	GSM population and habitat condition assessment.	To be completed	Offset site owner	Years 2, 4, 6, 8, 10 upon completion of surveys	DCCEEW TfN	Not Applicable
3	Audit report (Section 3.12).	To be completed	Approval holder (ABP)	End of years 1, 4, 8 and 10.	DCCEEW	Not Applicable

5. References

- Biosis 2017a. 165-195 O'Herns Road Epping: Biodiversity Assessment. Report prepared for MAB Corporation. Authors: Mueck, S & Gilmore, D. Biosis Pty Ltd, Melbourne. Project no. 23682.
- Biosis 2019a. Sievers Lane, Glenhope, Victoria: Golden Sun Moth Offset Management Plan (EPBC 2017/7930). Report for Alliance Business Park Pty Ltd. Author: Mueck, S., Biosis Pty Ltd, Melbourne. Project no. 28455.
- Biosis 2019b. Alliance Business Park EPBC Act Offset Management Plan: Shelford – Mt Mercer Road Shelford (Thurlgona). Report for Alliance Business Park Pty Ltd. Author: Steve Mueck, Biosis Pty Ltd, Melbourne. Project No. 28455.
- Biosis 2023. Offset Site Report: Boyers Road offset site, Golden Sun Moth offset site condition. Report prepared for Alliance Business Park. Authors: Mueck, S. Biosis Pty Ltd, Melbourne. Project no. 38934.
- Commonwealth of Australia 2012. *Environment Protection and Biodiversity Conservation Act 1999 – Environmental Offsets Policy*. Australian Government Department of Sustainability, Environment, Water, Population and Communities.
- Commonwealth of Australia 2014. *Guidelines for the preparation of an offset management plan under the EPBC Act offsets policy*. Australian Government Department of Sustainability, Environment, Water, Population and Communities, Canberra.
- DEECA 2023. *Management Standards for Native Vegetation Offset Sites*. Victorian Government Department of Energy, Environment and Climate Action, Melbourne.
- DELWP 2017. Guidelines for the removal, destruction or lopping of native vegetation, Department of Environment, Land, Water, and Planning. East Melbourne, Victoria.
https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/91146/Guidelines-for-the-removal,-destruction-or-lopping-of-native-vegetation,-2017.pdf.
- DEPI 2013. Sub-regional species strategy for the Golden Sun Moth. Victorian Government Department of Environment and Primary Industries.
- DoEE 1999. *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. Australian Government Department of the Environment and Energy.
- DSE 2004. *Native Vegetation: Sustaining a living landscape. Vegetation Quality Assessment Manual – Guidelines for applying the Habitat hectares scoring method. Version 1.3*. Victorian Government Department of Sustainability & Environment, Melbourne.
- DSE 2010. Victorian Biodiversity Atlas. August 2010 © The State of Victoria. Victorian Government Department of Sustainability & Environment, Melbourne.
- Hamilton Environmental Services 2020. *Golden Sun Moth survey November 2020 – Boyers Road Glenhope*. Report for Cassinia Environmental. Author Steve Hamilton, Tatong, Victoria.
- Marshall, A. 2013. *Start with the grasslands: Design guidelines to support native grasslands in urban areas (Final Draft)*. Victorian National Parks Association, Melbourne.
- Williams, NSG, Marshall, A and Morgan, JW (eds.) 2015. *Land of sweeping plains: Managing and restoring the native grasslands of south-eastern Australia*. CSIRO Publishing, Clayton South, Victoria.

Appendices

Appendix 1 GSM habitat scoring system

Golden Sun Moth *Synemon plana*

The EPBC Act Offsets Assessment Guide requires Golden Sun Moth *Synemon plana* (GSM) habitat to be given a score out of 10. After several months of advice from the Department of Environment and Energy (DoEE), the GSM habitat was assigned a quality score according to the scoring system provided below (Table 1). This is currently the recommended method for scoring GSM habitat quality (Vaughn Cox, DoEE, *pers. comm.*).

Table 1 GSM habitat quality scoring system as advised by DoEE (pers. comm. 2019)

Parameter	Scoring system
Site context (max. 3 points)	0/3 = Habitat patch¹ size <0.25 ha.² 1/3 = Habitat patch size more than 0.25 ha and up to 10 ha.² 2/3 = Habitat patch size more than 10 ha, shaped appropriately³ to reduce edge effects.² 3/3 = Habitat patch size more than 10 ha, shaped appropriately to reduce edge effects, slightly sloped (3° or less) and north-facing, minimal shading.
Site condition (max. 3 points)	0/3 = dominated by introduced vegetation that is not a known food source. 1/3 = dominated by poor quality native vegetation (VQA site condition score up to 30/75) including <20% cover known food source. 2/3 = dominated by moderate quality native vegetation (VQA site condition score 31-45/75) including between 20% and 40% cover known food source with limited inter-tussock space (<5%), or dominated by introduced vegetation that is a known food source (i.e. Chilean needle grass) where the species stocking rate⁴ is greater than 20 moths per hectare. 3/3 = dominated by high quality native vegetation (VQA site condition score 46+/75) including >40% cover known food source and appropriate inter-tussock space.
Species stocking rate^{4,5} (max. 4 points)	0/4 = species not present 1/4 = 0-5 males per hectare 2/4 = >5-20 males per hectare 3/4 = >20-50 males per hectare 4/4 = >50 males per hectare

Notes to table:

¹A patch is considered to be an area of GSM habitat separated from other areas of suitable habitat by >200m of unsuitable habitat, or barriers to flight (e.g. buildings, solid fences). A habitat patch should not be defined by administrative boundaries such as farm fencing, title or lot boundaries if habitat is continuous on either side of the boundary. According to the guidelines, *if the amount of GSM habitat adjoining the site of the action cannot be determined, the area of habitat will be considered to be the same as that identified within the site.*

²Add 1 point (up to a maximum of 3) where a patch is an occupied linkage between 2 populations.

³Assessed on a case by case basis.

⁴Stocking rate (measured as males per hectare) calculated as: total number of males recorded across four surveys in one flight season divided by area of habitat surveyed (with survey area confirmed with GPS tracks). It is not expected that results can be extrapolated across unsurveyed areas unless justification is given (e.g. the surveyed area is a sub-sample of the total area). Stocking rate calculations to be rounded up if required.

⁵It is expected that impact and offset sites to be surveyed on four occasions during the flying season and the survey results to be summed (consistent with survey guidelines). Justification will need to be provided to the Department to support proceeding in the absence of suitable survey effort. For clarity, if lower survey effort than four complete surveys is accepted, the Department will consider:

- For impact sites: the highest recorded density is assumed to be the remaining score (e.g. if three surveys detect 5, 10, 15 males/ha, the assumed score for the last survey is 15 males/ha).
- For offset sites: the lowest record is assumed to be the remaining score (e.g. if three surveys detect 5, 10, 15 males/ha, the assumed score for the last survey is 5 males/ha).
- For either type of site, if one survey records 5 males/ha, then assumed total of four surveys is 20 males/ha.

Appendix 2 DCCEEW EMP Guidelines Risk Framework

Risk Framework

		Consequence				
		Minor	Moderate	High	Major	Critical
Likelihood	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Likelihood

Qualitative measure of likelihood (how likely is it that this event/circumstances will occur after management actions have been put in place/are being implemented)

Highly Likely	Is expected to occur in most circumstances
Likely	Will probably occur during the life of the project
Possible	Might occur during the life of the project
Unlikely	Could occur but considered unlikely
Rare	May occur in exceptional circumstances

Consequence

Qualitative measure of consequences (what will be the consequence / result if the issue does occur)

Minor	Minor incident of environmental damage that can be reversed
Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts
High	Substantial instances of environmental damage that could be reversed with intensive effort
Major	Major loss of environmental amenity and real danger of continuing
Critical	Severe widespread loss of environmental amenity and irrecoverable environmental damage