Alliance Business Park EPBC Act Offset Management Plan: Shelford – Mt Mercer Road Shelford (Thurlgona) (EPBC 2017/7930)

Final Plan

Prepared for Alliance Business Park Pty Ltd

13 March 2019

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Document information

Report to:	Alliance Business Park Pty Ltd
Prepared by:	Steve Mueck
Biosis matter no.:	28455

Document Information:

Version/date	Internal review by	Date sent to client
Draft version 01	LS	21/02/18
Draft version 02	SGM	29/03/18
Draft version 03	SGM	12/06/18
Final version 01	SGM	15/02/19
Final version 02	SGM	05/03/19
Final version 03	SGM	13/03/19

File name: 28455.GrasslandBellchambers.OMP.Final.13032019

Citation: Biosis 2019. 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.

ACKNOWLEDGEMENTS

Biosis acknowledges the contribution of the following people and organisations in undertaking this study:

- MAB: Dan Rush, Michael Martin
- Department of Sustainability & Environment for access to the Victorian Biodiversity Atlas

The following Biosis staff were involved in this project:

- Sonika Kumar for mapping

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Declaration of accuracy

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

Dan Rush
Project Manager
Alliance Business Park Pty Ltd

Summary

Biosis Pty. Ltd. was commissioned by Alliance Business Park Pty Ltd (ABP) to prepare an Offset Management Plan (OMP) for a section of a pastoral property at Shelford – Mt Mercer Road, Shelford (Thurlgona) in Victoria. The section assessed (covering 9.50 ha) is part of Lot 4 LP4563 within the Parish of Shelford (the offset area). The property is currently owned by Thurlgona Pty Ltd and Thurlgona 2 Pty Ltd.

The 9.5 hectare offset area meets the quantity and quality requirements for an offset of Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) as determined by Department of the Environment and Energy (DoEE) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and in association with referral 2017/7930. It also provides part (9.5 hectares) of the 123.6 hectare offset requirement for the protection of Golden Sun Moth *Synemon plana* (GSM) habitat prescribed with that referral.

Specifically this plan addresses the approval under the EPBC Act for the industrial and commercial development at 165 – 195 O'Herns Road, Epping, Victoria as outlined under referral 2017/7930. The EPBC approval (2017/7930) specifies the following condition in relation to the provision of offsets:

3. The approval holder must, within 2 months of approval of the Offset Strategy specified in condition 2, submit an Offset Management Plan(s) for approval by the Minister. The approval holder must not commence the action until the Offset Management Plan(s) has been approved by the Minister. Once approved, the approved Offset Management Plan(s) must be implemented. The Offset Management Plan(s) must:

- *a. be prepared by a suitably qualified expert*
- *b. be prepared in accordance with the Department's Environmental Management Plan Guidelines, and the EPBC Act Environmental Offsets Policy*
- *c. provide a written description and map that clearly defines the location and boundaries of the offset area(s), consistent with the Offset Strategy approved under Condition 2. This must be accompanied with the offset attributes and shape-files*
- *d. a survey and description of the current condition (prior to any management activities) of the offset area proposed, including existing vegetation (the baseline condition)*
- *e. detail management actions, regeneration and/or revegetation strategies (i.e. weed, grazing and/or fire management) to be undertaken on the offset area(s) to improve and extend Golden Sun Moth habitat, Matted Flax-lily habitat and NTGVVP, including:*
  - *i. a description and timeframe of measures that will be implemented to improve the condition and extent of Golden Sun Moth habitat, Matted Flax-lily habitat and NTGVVP within the offset area(s)*
  - *ii. performance and completion criteria for evaluating the management of the offset areas, and criteria for triggering remedial action*
  - *iii. a program to monitor and report on the effectiveness of these measures, and progress against the performance and competition criteria*
  - *iv. a description of potential risks to the successful implementation of the plan, a description of the measures that will be implemented to mitigate against these risks and a description of the contingency measures that will be implemented if defined triggers arise*
  - *v. details of who is responsible for monitoring, reviewing and implementing the plan.*

A suitable offset site has been identified near Shelford, Victoria. The offset area is located within a larger offset property, and management prescriptions within this plan are consistent with the plans for the broader property. The offset area has been the subject of both a vegetation condition assessment identifying areas of NTGVVP and a targeted survey for GSM which has been recorded at numerous locations across the property (Biosis 2017 & 2018).

The entire 9.5 hectare offset site is defined as NTGVVP and it also represents moderate to high quality habitat for GSM, having regard for the existing GSM records and site context. This provides for an offset of about six times the impact to NTGVVP at the eastern extension to ABP covering land at 165 O'Herns Road Epping.

In conjunction with 114.1 hectares provided at an additional offset area (Sievers Lane) (Biosis 2019), this property also contributes to a total offset area of 123.6 hectares, amounting to an offset of about six times the impact to GSM habitat at the eastern extension to ABP covering land at 165 O'Herns Road Epping.

This OMP requires that some non-biodiversity oriented land use rights are relinquished and that management actions have the primary objective of conservation and ecological improvement of defined areas of GSM habitat and its associated native vegetation values. The management actions outlined in this plan consider key management issues identified for NTGVVP and GSM habitat.

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 initial 10 years of this OMP, and maintained through enduring commitments to manage the offset site for NTGVVP, GSM and biodiversity conservation.

This plan specifies a range of management actions for the offset area, including weed management and protection of the habitat values of the offset site from degradation by stock and unauthorised access. The plan includes an adaptive management approach, 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 NTGVVP and GSM habitat. The risk assessment also includes triggers for plan review, following environmental events such as significant weed invasion that has the potential to prejudice attainment and maintenance of OMP completion criteria.

1. Introduction

1.1 Project Background

Biosis Pty Ltd was commissioned by Alliance Business Park Pty Ltd (ABP) to prepare an Offset Management Plan (OMP) for an offset site required for losses associated with the industrial and commercial development at 165 – 195 O'Herns Road, Epping, Victoria as outlined under referral 2017/7930 (Figure 1).

An ecological assessment of the O'Herns Road 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 Golden Sun Moth *Synemon plana* (GSM) habitat 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, to identify the extent of NTGVVP and GSM habitat to be protected outside the project area.

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) as part of the development approvals process. The development has also been assessed and approved by the Department of the Environment and Energy (DoEE) under the EPBC Act through referral 2017/7930.

The plans approved by Whittlesea Council would result in clearing of 1.608 hectares of native vegetation equivalent to NTGVVP. This impact would also result in the loss of 17 individuals of Matted Flax-lily *Dianella amoena* and 20.53 ha of GSM habitat (Figure 2).

Offsets for the proposed development are prescribed by both state (DELWP) and federal (DoEE) regulators. Offsets prescribed from the EPBC Act and the Guidelines cannot be generated concurrently and will therefore be sourced separately. To compensate for the loss of NTGVVP and GSM habitat as a result of the proposed development, an external offset supporting 9.5 hectares of NTGVVP and 123.6 hectares of GSM habitat will be secured in accordance with the EPBC Act Environmental Offsets Policy.

The external EPBC Act offset for NTGVVP and part of the GSM offset prescription is proposed to be sourced from a 9.5 hectare section of Lot 4 of LP4563 at Shelford – Mt Mercer Road Shelford (Thurlgona) (Figure 3). An ecological assessment of the proposed external offset area was conducted by Biosis (2018). This report provides the basic ecological information to support this OMP and identified one remnant, largely contiguous patch of NTGVVP supporting a significant population of GSM (Figure 4, Biosis 2017).

Management of the external EPBC Act offset will involve protection and active ecological management of 9.5 hectare of high quality remnant of the Ecological Vegetation Classes (EVC) Plains Grassland (EVC 132) which also corresponds to the EPBC Act listed community NTGVVP (Figure 4).

Both the O'Herns Road industrial subdivision and Shelford offset site (Thurlgona) are within the Victorian Volcanic Plain (VVP) Bioregion (www.delwp.vic.gov.au). The Thurlgona offset site is approximately 120 km west of the O'Herns Road development site.

A glossary of technical terms used throughout this OMP is provided in Appendix 3.

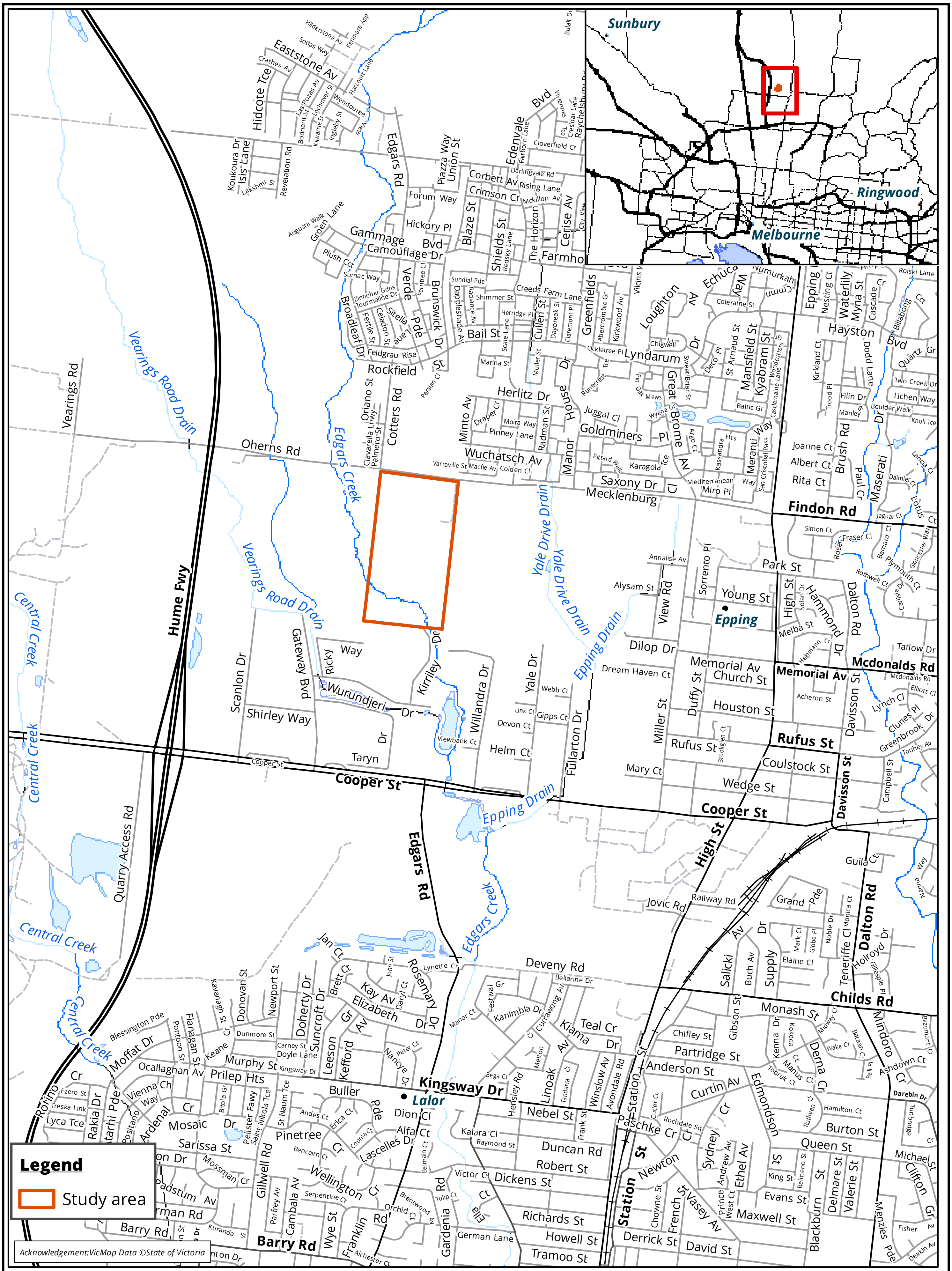

Figure 1 Location of Alliance Business Park (East), Epping Victoria

Matter: 25346,
Date: 31 July 2017,
Checked by: SGM, Drawn by: SSK, Last edited by: skumar
Location:P:\25300s\25346\Mapping\25346_F1_Location.mxd

0 250 500 750 1,000
Metres
N
Scale 1:25,000 @ A4, GDA 1994 MGA Zone 55

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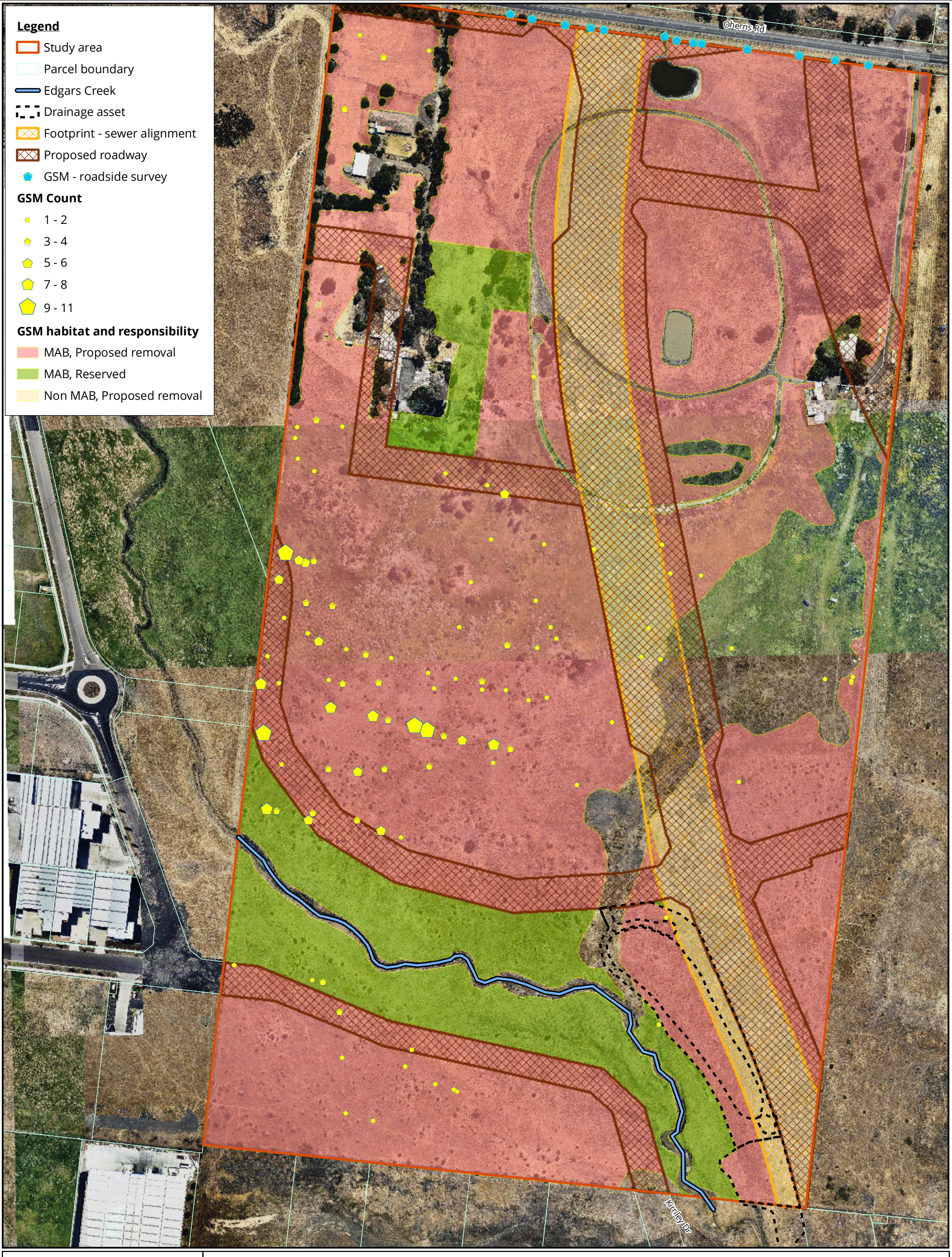

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Figure 2 Golden Sun Moth habitat within Alliance Business Park (East), Epping Victoria

Acknowledgements: Vicmap ©State of Victoria

Matter: 25346,
Date: 22 September 2017,
Checked by: SGM, Drawn by: SSK, Last edited by: skumar
Location:P:\25300s\25346\Mapping\25346_F6_GSM_Habitat

0 25 50 75 100
Metres

Scale 1:2,250 @ A3

Coordinate System: GDA 1994 MGA Zone 55

N

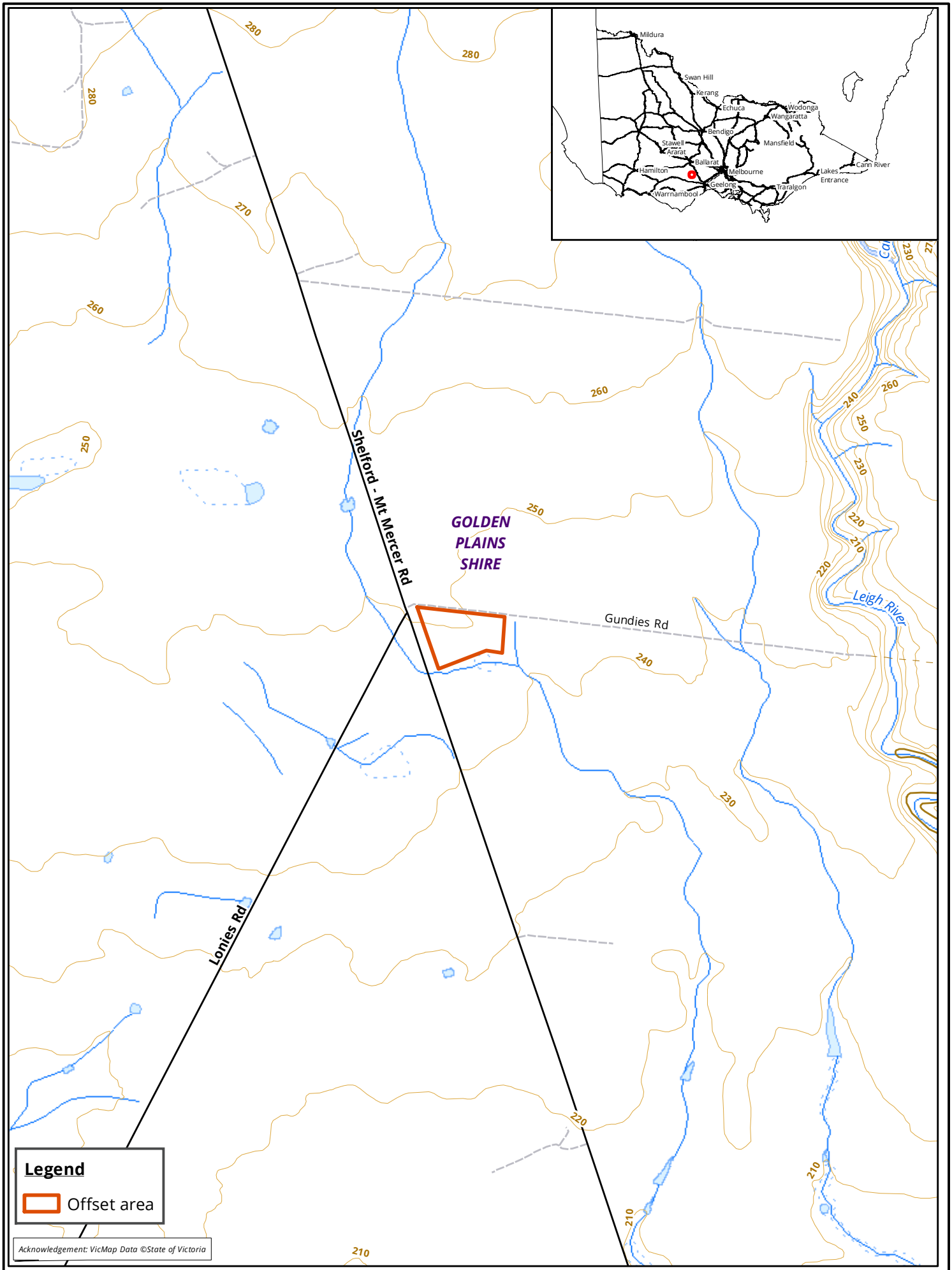

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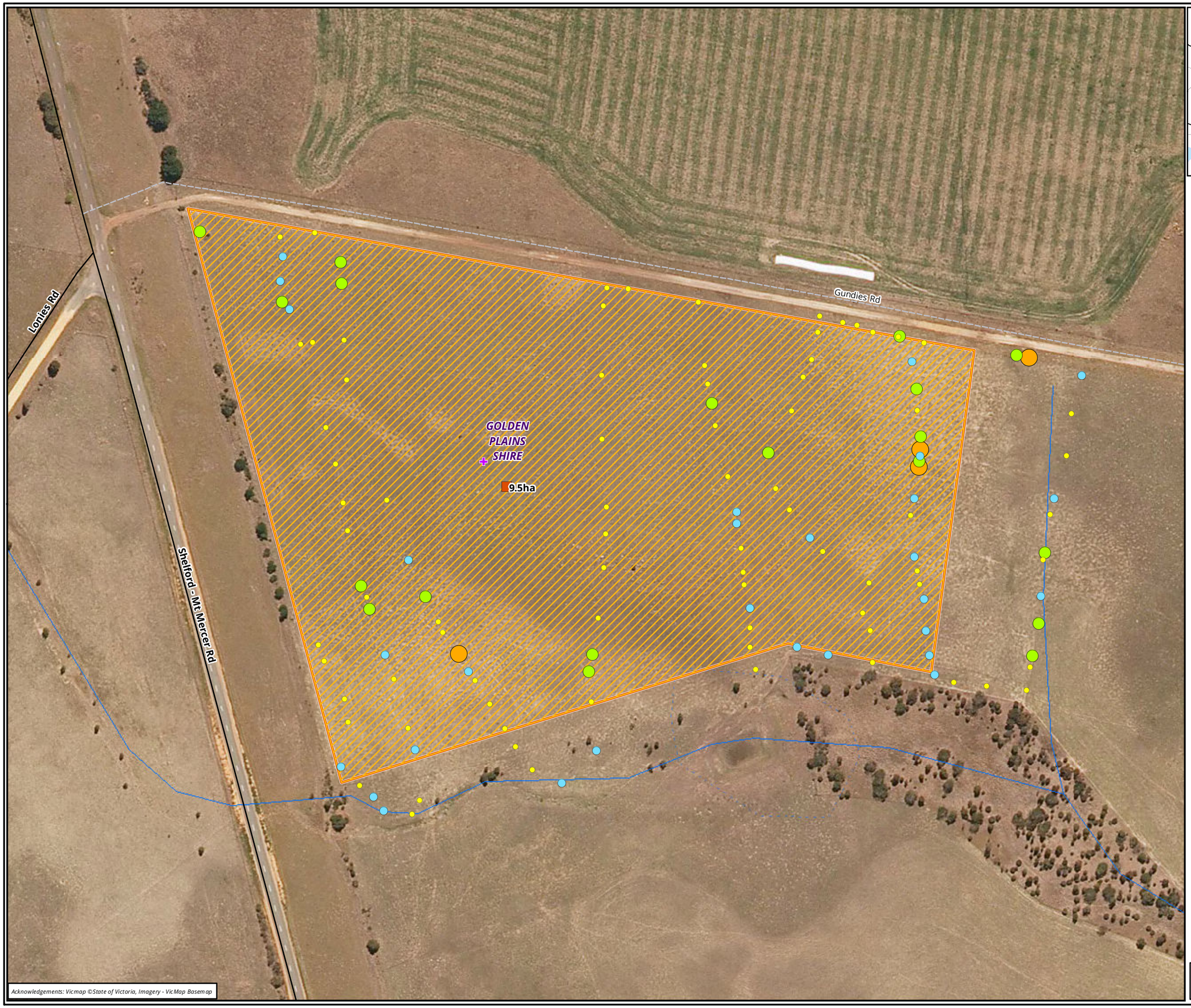
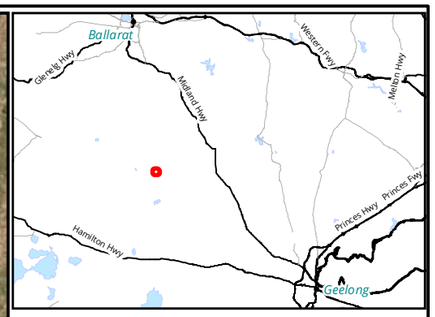
Figure 3 Location of offset area - Lot 4 Shelford – Mt Mercer Road, Shelford, Victoria 3329

Matter: 28455,
Date: 13 March 2019,
Checked by: SGM, Drawn by: SKM, Last edited by: jturner
Location:P:\28400s\28455\Mapping\28455_F3_Shelford_Locality





Legend

- Offset site
- Natural Temperate Grassland of the Victorian Volcanic Plain

Golden Sun Moth (Count)

- 1
- 2
- 3 - 5
- 6 - 10

Significant Flora species

- *Cullen parvum* - Small Scurf-pea
- Photo monitoring point

Figure 4 Ecological features of the offset site - Lot 4 Shelford – Mt Mercer Road, Shelford, Victoria 3329

0 20 40 60 80 100

Metres
Scale: 1:2,000 @ A3
Coordinate System: GDA 1994 MGA Zone 54

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Matter: 28455,
Date: 13 March 2019,
Checked by: SGM, Drawn by: SKM, Last edited by: jturner
Location:P:\28400s\28455\Mapping\28455_F4_Shelford_Ecofeatures.mxd

1.2 Objectives

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

- Improve the condition of 9.5 ha of NTGVVP and GSM habitat at the Thurlgona offset property in a manner consistent with the EPBC Act Environmental Offsets Policy;
- support establishment of legal security arrangements for the in perpetuity protection and management of the offset site;
- Undertake management actions to protect and improve the quality of NTGVVP and GSM habitat within the offset site;
- Provide a timetable of management actions, outcomes and progress reviews;
- Detail appropriate monitoring and evaluation of management actions and completion criteria; and
- Attain and maintain the offset completion criteria for the life of the EPBC Act approval for EPBC 2017/7930.

1.3 Report structure

The structure and content of the OMP is consistent with the requirements of the 'Standard Offset Plan' template provided by the Department of Environment, Land, Water and Planning (DELWP) and is organised in several 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).
- **Part B: Offset Implementation** - This section describes how the offset is to be implemented. Part B includes details regarding landowner and EPBC Act approval holder commitments, management activities, monitoring and reporting. This section is intended for those responsible for implementing the plan, including ABP and future landowners. Information in this section is intended to be placed on title.

The plan also addresses the requirements of guidelines for the preparation of an environmental management plan (Commonwealth of Australia 2014).

2. Part A: Offset Suitability

This section provides details of the clearing 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 clearing site and the proposed offset site are provided in Figures 1 and 2 respectively.

2.1 Clearing Site Details

Landowner of development site	Alliance Business Park Pty Ltd
Location and address of clearing site	165 – 195 O'Herns Road, Epping, Victoria
Local Government Area	City of Whittlesea
Catchment Management Authority	Port Phillip and Western Port
Responsible Authority	Department of Environment, Land, Water and Planning
Permit applicant	Alliance Business Park Pty Ltd
Planning Permit Number (ID)	716886
Date Approved	21 November 2017
EPBC Act Referral	2017/7930
Date Approved	25 September 2018

2.2 Vegetation Approved for Removal

Vegetation / habitat removal associated with the eastern expansion of ABP (Figure 1) has been approved under the City of Whittlesea Planning Permit 716886 and the EPBC Act approval for EPBC 2017/7930. Vegetation proposed for removal is described in the biodiversity assessment prepared by Biosis (2017a) and the 20.53 hectares of GSM habitat to be removed is identified in Figure 2.

2.3 Description of the Thurlgona Offset Site, Shelford, Victoria

The nominated offset site at Shelford – Mt Mercer Road Shelford (9.5 hectares), has been identified as contributing to meeting Commonwealth offset policy requirements, as identified by the offset strategy (Biosis 2019) and approved by DoEE on 25 January 2019. In combination with a 114.1 hectare offset site at Glenhope (Biosis 2019), ABP will provide a total offset package of 9.5 hectares of NTGVVP and 123.6 hectares of occupied GSM habitat for its approved expansion. The following summarises the existing conditions at the Thurlgona offset site, including current permitted uses on the land and its suitability as an offset as assessed against Commonwealth requirements.

The offset area (9.5 hectares) is located at Lot 4 of LP4563, on the southern margin of Gundies Road, and east of Shelford – Mt Mercer Road Shelford. The site is approximately 14.5 km north of Shelford and approximately 90 km west of the Melbourne central business district (Figure 3). The property is currently zoned Farming Zone and is not covered by any overlays relating to biodiversity or inundation. The land is owned and managed by Thurlgona Pty Ltd and Thurlgona 2 Pty Ltd who also hold broader areas of farmland in this area. The site is currently used for domestic stock grazing.

The offset area assessed is part of a broader, approximately 186 ha parcel (Figure 4). This parcel includes substantial areas dominated by NTGVVP (also identified as Plains Grassland (EVC 132)) in relatively uniform condition. Other portions of this parcel of land have been secured as offsets for other development projects. The broader paddock includes internal and boundary fencing to control stock movements between the balance of the property and other adjacent properties.

The proposed offset area (the area subject to this OMP) is in the north western corner of this parcel (Figure 4). The offset area supports one habitat zone which will be managed to provide all of the NTGVVP offsets and 9.5 ha of 123.6 ha required GSM offsets for development of the O'Herns Road industrial subdivision (Referral EPBC 2017/7930).

A detailed description of the flora and habitat hectare values within the proposed offset area is included in Biosis (2018) which identifies a total of 25 indigenous and 25 introduced plant species. This species list is included in Appendix 1. More indigenous and weed species are likely to be present as seasonal conditions and survey intensity typically prevent the detection of all species present within a defined area.

The study area has no known history of cultivation, significant pasture improvement or intensive fertilizer application. However, at present pasture improvement activities and fertiliser application remain existing rights for the use of this land.

The site is variously dominated by indigenous grasses such as Spear-grass *Austrostipa* spp., Wallaby-grass *Rytidosperma* spp., Tussock-grass *Poa* spp. and Common Wheat-grass *Anthosachne scabra*. Common herbaceous species include Sheep's Burr *Acaena echinata*, Lemon Beauty-heads *Calocephalus citreus*, Blue Devil *Eryngium ovinum*, and Dock *Rumex* spp.

The most prevalent weeds are annual grasses although there are scattered occurrences of woody weeds such as Sweet Briar *Rosa rubiginosa* and Common Blackberry *Rubus anglocandicans*.

Current permitted land uses

The property is zoned Farming Zone (FZ) within the Golden Plains 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.

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 millimetres 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 firefighting access tracks.

There are no existing buildings within the portion of the property in which the offset site is located.

Existing offset arrangements

The proposed offset site has not been allocated for the provision of any other offsets, either under the EPBC Act Environmental Offsets Policy or for provision of offsets under any current or past Victorian policy, including the Biodiversity Assessment Guidelines or the Net Gain Framework.

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

3. Part B: Offset Implementation – Thurlgona

This section presents the actions required to implement the OMP. The OMP details methods for the management, conservation and improvement of native vegetation at the offset site for the benefit of the protected matters (NTGVVP & GSM) over a ten year period commencing from EPBC Act approval of this OMP. These actions are required over the initial ten year period and, while the OMP may be updated after that period with approval from DoEE, active ecological management to maintain or improve NTGVVP and GSM habitat condition is required for the life of the EPBC Act Approval and from thereon in perpetuity.

All works will be conducted by a suitably qualified and experienced contractor and/or the landholder. Prescribed management actions are, where relevant, in accordance with the Victorian BushBroker standards for management (DSE 2012a, DSE 2012b and DSE2012c).

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

3.1 Offset Site Details

Table 1 provides details of the offset site, including the landowner, parcel details and local government property information.

Table 1 Offset Site Details

Offset Site Details	
Landowner of offset site	Thurlgona Pty Ltd and Thurlgona 2 Pty Ltd
Type of offset	3rd party
Location and address of offset site	Shelford – Mt Mercer Road, Shelford VIC 3329
Area of offset site (hectares)	9.50
Parish	Shelford
Allotment	Lot 4 LP4563
Volume / Folio	08967 / 632
Local Government Area	Golden Plains Shire
Council Property Number	52010436
Bioregion	Victorian Volcanic Plain

3.2 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 native grassland which will be managed in a sympathetic manner on a voluntary basis. The current land owners have secured formal offset agreements to protect other portions of this broader area of native grassland 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 offset area. No future easements can be applied to the offset area as these are likely to conflict with the objectives of this OMP.

3.3 Offset Security and Management Responsibility

ABP 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 Shelford – Mt Mercer Road, Shelford. The property is owned by Thurlgona Pty Ltd and Thurlgona 2 Pty Ltd (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 2.

Table 2 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 *Victorian Conservation Trust Act 1972*
Date of commencement for the covenant	To be completed in 2019
Date agreement registered on-title	To be completed in 2019
Offset site management responsibility	Thurlgona Pty Ltd and Thurlgona 2 Pty Ltd
Offset Monitoring Responsibility	Thurlgona Pty Ltd and Thurlgona 2 Pty Ltd
Site management	Thurlgona Pty Ltd and Thurlgona 2 Pty Ltd
Monitoring	Thurlgona Pty Ltd and Thurlgona 2 Pty Ltd
Auditing	Alliance Business Park Pty Ltd
Reporting responsibility (to TfN)	Thurlgona Pty Ltd and Thurlgona 2 Pty Ltd
Reporting responsibility (to DoEE)	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 in 2019. 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.

The covenant will specifically state the in-perpetuity land-use commitments across the offset site to:

- Retain and manage all native vegetation as directed by this offset management plan;
- Retain all fallen timber and branches;
- Exclude domestic stock except as permitted by this plan;
- Exclude the use of stock feed such as hay or other material which could support weed seeds that is sourced from outside the offset area. Sterile feed such as pellets may be sourced externally;

- Eliminate any woody weeds and control the cover of other high threat weeds ensuring this cover does not exceed levels achieved upon attainment of Year 10 offset completion criteria;
- Ensure that pest animals are controlled and that level of control attained at the completion of Year 10 of management is maintained in perpetuity.
- Exclude pasture improvement and any type of cultivation and cropping;
- Exclude fertilizer application.
- Control the accumulation of ground cover biomass through either the controlled grazing of sheep or using the controlled application of fire;
- Monitoring for any new and emerging weeds and continuously treating those weeds to avoid further seed set, dispersal or infestation;
- Maintain a progressive annual works plan which caters to current conditions and prescribes ongoing management with the promotion of native perennial grasses, and attainment and maintenance of offset completion criteria, as its primary objective; and
- Monitor and report on the abundance of GSM within the offset site during the first flight season after EPBC Act approval of this OMP and then during the flight seasons in years 2, 4, 6, 8 and 10 of this OMP and thereafter as requested by DoEE.

Implementation of this management plan is the overall responsibility of ABP, which has engaged the land owner (Thurlgona Pty Ltd and Thurlgona 2 Pty Ltd) to deliver the offset outcomes on APB's behalf. However, direct management responsibility may be delegated to a designated site manager and/or managing ecologist. The land owner is responsible for engaging a qualified ecologist to conduct monitoring (Section 3.9) with reports submitted to TfN, ABP and DoEE. Management actions by the land owner 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 input into the annual works program.
- Review of ecological monitoring reports including an assessment of attainment and maintenance of the offset completion criteria.

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 on 15 April 2019 with registration of the covenant to be completed as soon as possible in 2019. While preparation of the covenant is expected to be completed in early 2019, formal signing of the covenant by the Minister may be delayed by other priorities. However, ABP will pay all the prescribed fees within four weeks of the approval of this OMP. These fees will be non-refundable and the covenant signing will therefore be an administrative formality.

Funding for implementation of this OMP has been agreed between APB, the land owner and TfN. Where appropriate, or otherwise agreed, funding will be held by the TfN and paid to the land owner over the 10 year management period as per a land owner agreement. This will include agreed funding for anticipated ongoing management required to maintain completion criteria at the offset site in perpetuity, beyond the initial 10 year period during which the completion criteria are achieved.

3.4 Offset completion criteria

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

- Permanent legal protection of 9.50 hectares of NTGVVP and GSM habitat;
- Physical protection of the habitat area from manageable threats including uncontrolled stock grazing, weed infestations and degradation by pest animals.
- Attainment of NTGVVP and GSM completion criteria, as measured by habitat and GSM monitoring.

3.4.1 Future site condition - completion criteria

The 9.5 ha offset site must achieve the following site condition:

a) dominated by high quality native vegetation (VQA site condition score 51-75/75). The condition of NTGVVP will be assessed using the habitat hectare assessment protocols defined by DSE (2004);

b) 20% to 40% cover of a known food source for GSM with limited inter-tussock space (<5%); and

c) a GSM stocking rate of 20-50 males per hectare.

Monitoring assessments will be undertaken in marked quadrats distributed through the offset site as described in Section 3.9. A key performance target, to assist in attainment of the completion criteria will be to reduce the abundance of perennial, introduced pasture grasses such as Brown-top Bent, Toowoomba Canary-grass and Cocksfoot.

Attaining the nominated future condition class will require the VQA site condition score to be between 51 and 75 out of 75. Maintenance of the open tussock structure across the site, the removal of woody weeds and a decline of perennial grassy weed cover (including Brown-top Bent, Toowoomba Canary-grass and Cocksfoot) to less than 1% after 10 years of management (in comparison to baseline monitoring data) will substantially contribute to achieving the offset completion criteria. The decline in these common weed species is expected to be replaced by native grasses and herbs, predominantly spear-grasses and wallaby-grasses leading to an increase in the cover of perennial native plants, the overall condition of NTGVVP and the abundance of GSM food plants.

3.4.2 Performance criteria

Key performance criteria for this OMP are:

- Continuous improvement in average site condition as described in Section 3.4.1.
- Effective threat abatement, including the control of stock grazing, weeds and pests as specified in Section 3.8.
- Completion of scheduled management actions (Section 3.8 and Tables 4 & 6).
- Completion of scheduled monitoring activities (Section 3.9 and Table 6).
- Completion of scheduled reports and audits (Section 3.10, 3.11 and Table 7).

3.5 Limitations and uncertainty

This management plan has been formulated using information from recently conducted site inspections (Biosis 2018). 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 2017/18 flight seasons (Biosis 2018).

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 many of the native grasses present are GSM food plants, this management strategy is expected also to maintain 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.

3.6 Ongoing management commitments

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

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

- Eliminating all woody weeds through continuous detection, treatment and infestation prevention.
- Monitoring for any new and emerging weeds and eliminate through continuous detection, treatment and infestation prevention.
- Controlling rabbits, hares and foxes to an extent above existing legal requirements.
- Exclude stock except as otherwise specified under this approved plan.
- Exclude the use of stock feed such as hay or other material which could support 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 for the first ten years of the covenant, and only apply fertiliser in accordance with written agreement from the TfN. TfN may permit low levels of fertilizer application if the land owner can demonstrate that this will not adversely impact native vegetation or GSM habitat quality.

3.7 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 NTGVVP present from the existing site condition habitat score of 45/75 to an assessment of greater than 51/75 (see 3.4.1 above). 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 Victoria's Department of Environment, Land, Water and Planning (DELWP) (i.e. DSE 2009) and other publications (i.e. Marshall 2013, Williams et al. 2015).

The 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 grassland environment dominated by native species). 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 management activities need to be flexible to respond to changing conditions and unpredictable events. Examples of potential risks are outlined in Table 5 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 will be able to take advantage of seasonal fluctuations to achieve the completion criteria.

Woody weeds in particular currently have a very low cover within the offset site and it will be a relatively simple management exercise to eliminate these species. While woody weeds will probably 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 Canary-grasses, Brown-top Bent and Cocksfoot. 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 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 as the more comprehensive control achieved by such works the lower the ability these species 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 eight (8) years of management, the monitoring results indicate that the completion criteria are unlikely to be achieved, DoEE will be contacted to determine potential additional future offset requirements. 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, a new additional offset area will be provided to account for the failed offset. DoEE will be consulted to determine the suitability of the additional offset.

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 NTGVVP 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 grassland 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 until 2038 and the quality of the vegetation needs to be maintained in perpetuity. 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 4) and a risk assessment (Table 5) with associated monitoring (Table 6) and reporting (Table 7) programs.

Key risks identified in Table 5 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; 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 3.10) or audits (Section 3.11), will result in a review of this plan, as discussed in Section 3.12 and Table 5.

3.8 Management Actions and land use commitments

The main threats to this native grassland include the existing permitted uses associated with normal farming practices such as inappropriate grazing regimes, pasture improvement and fertiliser application. Other

threats include the expansion of the existing high threat weed populations, weed invasion in general and the accumulation of ground cover biomass. Currently the ground cover biomass is managed through grazing by domestic stock (i.e. sheep, but there are no current restrictions on what domestic stock may be grazed on site) and this is proposed to continue as a strictly controlled management practice. The use of fire for biomass control is also discussed.

Currently the site is not actively managed for biodiversity values and is utilised for domestic stock grazing.

The prescribed management actions outlined below are intended to achieve a conservation outcome which improves and maintains the viability of the offset site. This will be achieved through active ecological management (maintenance and improvement) and permanent protection of the offset site. Table 4 details these prescribed actions and outlines the relevant timing for implementation. These actions will be applied to the entire offset area identified in Figure 4.

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:

- Maintaining the existing fencing within the broader land parcel, and limiting access to the existing access gates unless otherwise authorised by the TfN as appropriate.
- Excluding stock except as otherwise prescribed by this plan.
- Weed control through active management;
  - Eliminating all woody environmental weeds
  - Controlling high threat weeds to levels specified in Table 3.
  - Controlling perennial grassy weed cover to less than 1%.
  - Controlling broadleaf weed cover to less than 2%.
  - Monitoring for any new and emerging weeds and eliminate
- Limiting organic litter and biomass accumulation (must not exceed the EVC benchmark cover of 10%);
- Biomass control through high intensity pulse grazing of domestic stock (sheep only) with grazing excluded from 31st August to 31st January (unless otherwise approved by TfN in writing because of unusual seasonal conditions);
- Ecological burning (the offset area may be burnt at least five times within the 10 year management period e.g. years 1, 3, 5, 7 and 9). No area is to be burnt more than once every two years;
- Controlling pest animals, particularly rabbits, hares, foxes and cats; and
- Managing native species understorey diversity and recruitment.

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 4 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 4) 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 DoEE for approval.

3.8.1 Fencing and access control

Permanent fencing able to exclude domestic stock already exists around the boundary of the broader 185 ha parcel and other subsets thereof. Additional fencing around the 9.5 hectare offset area (Figure 4) is not required as it is proposed that grazing within the broader paddock will be managed in accordance with the prescriptions outlined within this offset management plan. Temporary fencing may be used within the offset area where negligible impacts to native vegetation associated with the placement and removal of that fencing occurs.

Additional permanent fencing is also not recommended for the following reasons: 1) to avoid the need for establishing stock water access points which will displace native vegetation, 2) to avoid funnelling of traffic through access gates and associated disturbance to soil and 3) to discourage trampling of native vegetation by stock along fence boundaries and in the vicinity of the watering point(s). Instead, sheep will be allowed to graze the offset area as part of the broader existing paddock structure, with limitations described in the following.

Posts marking the boundary of the offset site will be set up to clearly identify the area for monitoring and management purposes. Posts will be located in accordance with advice from TfN and/or a qualified ecologist to ensure impacts to native vegetation are avoided.

Temporary stock fencing will be established and maintained around the boundary of any burnt area within the offset site for at least 6 months post-burn to prevent stock access and damage to regenerating vegetation.

The offset area remains private property and access or disturbance to the offset site by unauthorised persons is prohibited. The existing access gate and security (locked gates) arrangement is adequate to service the access management requirements of this offset area.

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 DELWP's fencing standards in BushBroker Information Sheet 12 - Standards for Management – Fencing, 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 land owner will ensure all fencing around the perimeter of the property is maintained in good condition according to the standards detailed in BushBroker Information Sheet 12 – Standards for Management – Fencing (DSE 2012c), for the term of the EPBC Act approval.

No additional signs identifying the property as an offset site are proposed. Explicit signage may inadvertently attract undesirable impacts. However signs identifying the property as a protected area of native vegetation will be considered by the owner.

Actions

- Maintain existing fencing to control access by domestic stock within the broader parcel and repair promptly if damage occurs.
- Temporarily fence any burnt area immediately prior to burning or immediately after wildfire, to exclude all domestic stock from grazing the burnt area for a minimum of 6 months.
- Establish posts to mark the boundary of the offset site for management and monitoring purposes under supervision from TfN and/or a qualified ecologist.
- Control access and any passive use to minimise impacts on native vegetation.
- Provide access for management vehicles into the offset site, using the existing access gates. No additional vehicle access is to be established.

3.8.2 Weed control

Weed control works are required to achieve biodiversity gains for an offset under the EPBC Act and DoEE requires a habitat improvement for both NTGVVP and GSM habitat. Targets below therefore identify a reduction in the cover of woody, perennial and annual weeds.

Annual grassy weeds are prominent and typically the total weed cover (annuals and perennials) is about 35%. The annual weeds, which are predominantly grasses, such as Fescue *Vulpia* spp., Quaking Grass *Briza* spp., Soft Brome *Bromus hordeaceus* and Hair Grass *Aira* spp., which are not considered a significant threat in this environment, will be managed using grazing to reduce their prominence. Direct active management using targeted grazing is expected to have an impact on the abundance of these species. However, it is possible in relatively wet years that grazing may not be able to have a large enough impact on ground cover biomass and in this situation the application of ecological burning will be evaluated. Application of fire prior to the seed set for weedy annual grasses is known to have a significant negative impact on these weeds (Robinson 2015). The timed application of fire is therefore strongly encouraged by this OMP.

An overall target for weed reduction is set from the current estimated level of 35% to 20% with the cover of perennial grassy weeds to be reduced to negligible levels (<1%).

All high threat weeds will be controlled to minimise or reduce their occurrence and ensure no further spread of weeds. The total cover of perennial grassy and broad-leaf weeds on site will be reduced from the current level of 10% to no more than 2%. This includes specific targets for high threat species identified in Table 3, perennial grassy weeds will be reduced to less than 1% total cover and broadleaf weeds will be reduced to less than 2% of the cover by the end of the ten year management period.

The emphasis for weed control is the prevention of weed seed production with the goal being the reduction in the total weed cover with specific targets for high threat species on site. Weed control works will be timed appropriately in accordance with Tables 4, 5 & 6.

Weed levels will be monitored and management methods adapted over time in response to changing conditions. New and emerging high threat weeds will be monitored and controlled (to less than 1% cover) if found. Any other significant environmental weeds identified during the ongoing site monitoring will also be controlled. If other high threat weeds, such as Serrated Tussock *Nassella trichotoma*, are found to occur in surrounding areas owned by the offset land owner, it would be prudent and cost effective to eliminate such species from nearby areas to reduce any potential invasion into the offset area. The offset owner will contact the land owner of any public land (i.e. council managed road reserves adjacent to the offset site) where high threat weeds occur within the vicinity of the offset area, with the aim to have these weeds controlled.

Woody weeds are known from the offset area and the broader 185 ha parcel. These include Sweet Briar *Rosa rubiginosa* and Blackberry *Rubus anglocandicans*. However these are only present at a relatively low cover. Where woody weeds are observed during site management or monitoring activities, these will be controlled and eliminated promptly (before fruiting and seed set). The existing woody weeds will be targeted for immediate control works and will not persist into the second year on management. The cover of woody weeds will be maintained at negligible to absent levels in perpetuity.

Spot spraying with appropriate herbicide is one of the main methods for reducing weed cover. Spot spraying will be undertaken regularly, particularly in spring and early summer, with a focus on killing weed plants prior to seed set. Biomass control is also considered as an effective method for controlling and reducing weed levels. Biomass control at the site will include controlled sheep grazing and, when considered appropriate, ecological burning. Spot spraying will be completed in a manner which minimises non-target damage. Spot spraying will not occur during high wind days or in close proximity to threatened flora without protective measures in place (i.e. physical shielding).

Table 3: High threat weeds for priority control (Biosis 2018).

Scientific Name	Common Name	% cover for the current assessment	Control Proposed	Desired Outcome^
Agrostis capillaris	Brown-top Bent	5%	New growth controlled by crash grazing with sheep to prevent seed set. Herbicide application as considered appropriate to achieve targets. Brown-top Bent is significantly disadvantaged by burning.	<1% cover
***Avena* spp.**	Oats	5%	Controlled pulse grazing by sheep to prevent seed set. Spot spraying appropriate herbicide to prevent seeding.	<1% cover
Other annual grasses (Briza, Bromus, Aira, Anthoxanthum, Lolium)	Annual Grasses	25%	Controlled pulse grazing by sheep to prevent seed set. Spot spraying appropriate herbicide to prevent seeding.	20% cover
Phalaris aquatica	Toowoomba Canary-grass	2%	Spot spraying appropriate herbicide (early spring).	<1% cover
Dactylis glomerata	Cocksfoot	2%	Spot spraying appropriate herbicide (early spring).	<1% cover
Lophopyrum ponticum	Tall Wheat-grass	<1%	Spot spraying appropriate herbicide (early spring).	Eliminate this emerging high threat weed
***Cirsium and Carthamus*.**	Thistles	2–3%	Spot Spraying appropriate herbicide (prevent flowering).	<1% cover

^ Desired outcome at 2029

Burning is particularly effective at reducing weed cover, especially for species that are difficult to control such as Brown-top Bent *Agrostis capillaris*. Burning and/or grazing will allow greater access and efficiency for weed control and increased natural regeneration of indigenous plant species (Sections 3.5.4 and 3.5.5 below). Periodic burning that is followed by spot spraying will be important for weed species that are difficult to control (such as Brown-top Bent) until they are replaced by native species.

Target species are likely to change over time in response to seasonal conditions, the result of pulse grazing or the conduct of any controlled burns (e.g. likely flush of broad-leaf weeds to be treated post-burn). Weed cover and species will therefore be monitored and management adapted to achieve the habitat condition offset completion criteria for NTGVVP and GSM. TfN will be consulted and approve the control techniques for any new or emerging weeds identified within the offset area.

Monitoring for new and emerging weeds will be conducted throughout the year for the term of the agreement, and any new and emerging weeds will be eradicated.

The offset area is not in close proximity to any named waterway although a number of seasonal wetlands occur within this parcel and its surrounds. While there maybe localised surface water flows during high rainfall events, any wetland within the site is ephemeral and no specific runoff risk is identified for the application of herbicides to this area.

Actions

- Spot spraying of weeds with appropriate herbicide will be undertaken, particularly through spring and early summer.
- Target weeds will be controlled in a timely manner and before seed set; this requires regular monitoring and multiple treatments during the growth season.
- Ensure the absence of high threat woody weeds within the offset area through monitoring and where found to occur, control and eliminate promptly. Preferably control nearby infestations to prevent the spread of these species.
- Control works will ensure that the total cover of perennial weeds will be reduced to no more than 2% and preferably eliminated. Specific targets include: a reduction of high threat weeds in accordance with Table 3; perennial grassy weeds will be reduced to less than 1% total cover; and broadleaf weeds reduced to no more than 2% cover.
- Monitoring will be undertaken to demonstrate the effectiveness of weed control works and the results will be used to adapt future control works and targets.
- Infestations of new and emerging high threat weeds will be eradicated. This will be achieved in consultation with TfN.
- Any other significant environmental weeds identified during the ongoing site monitoring will also be controlled in consultation with TfN.
- During weed control, natural regeneration of indigenous flora will be protected from off-target damage.

3.8.3 Pest Animals

The control of vermin including rabbits and other pest herbivores beyond the legal duty of care is a requirement of this OMP. Therefore pest animal control works are required within the offset site.

Grazing by European Rabbits *Oryctolagus cuniculus* and European Hares *Lepus europeaus* is evident and is likely to have a significant impact within the offset site. However, no active rabbit warrens were noted within the offset site.

Currently rabbits and hares are controlled by shooting and this appears to be effective at this point in time. If this changes, baiting can be considered as an option for control of these pests.

Control within the offset site would effectively be achieved through a reasonable level of works to eliminate any active warrens in the local area (i.e. land within the owners control and within 500 m of the offset site). Control will in part be achieved through the removal and destruction of the shelter provided by any shrubby weeds within the broader area managed by the same landowner. The landowner will therefore control all shrubby environmental weeds on their land within 500 metres of the offset site. Control of rabbits will be undertaken in accordance with current guidelines provided by the relevant Victorian Government Department.

Ripping of rabbit warrens within the offset site is not permitted. If any warrens develop within the offset site they will be treated by low impact measures such as fumigation or implosion.

Other problem pest animals may include cats and foxes although the general lack of shelter and harbour for these species reduces the likelihood that any animals are resident in the local area. Control techniques such

as poisoning are therefore likely to be ineffective. The landowner will select from the range of control techniques available and apply the most effective in the local conditions.

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 2 to 4 hours of walking 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 land owner will monitor and control rabbits, hares and foxes all year round as well as any new and emerging pest animals.

Actions

- Control and seek to locally eliminate European Hares, European Rabbits, cats and foxes and using appropriate control techniques including shooting, poison baits or similar methods, without soil disturbance.
- At a minimum spotlight shooting over a minimum period of three hours targeting all pest animals will occur over the entire site once every three months. This will be conducted by the landowner or a professional shooter employed by the landowner.
- Fumigate rabbit warrens within three weeks of detection. Fumigation works will be conducted by a suitably qualified operator.

3.8.4 Biomass / Organic Litter control

Biomass management throughout the offset site is essential to maintain the open tussock grassy ground cover structure preferred by GSM and prevent excessive competition for grassland forbs. 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 30%, biomass will 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 native grasslands of this site, this method of disturbance regime (grazing by domestic

stock) is seen as a reliable and conservative action to maintain and improve the ecological values associated with the area. While grazing by domestic stock will continue to be used at this site as a method of biomass reduction, it will be undertaken in a controlled manner following a grazing management plan. Biomass accumulation control at this site will therefore be consistent with the standards for management of ecological grazing provided by DSE (2009).

In this context pulse grazing (i.e. using high numbers of sheep over short periods) in the offset area to maintain an open tussock grassland structure is seen as a precautionary management method to maintain the species richness of these native grasslands. Pulse, rather than continuous grazing is seen as optimal as this discourages sheep from feeding selectively. In that context the extent of biomass removal will depend on the seasonal growth conditions prevalent at the time with the duration of the pulse grazing event dependant on the number of animals which can be put on site at any one time. Ideally pulse grazing will establish and maintain an open grassy tussock structure. The extent and duration of grazing will therefore take an adaptive approach, based on the extent of biomass present. However, on average a pulse grazing regime is expected to be restricted to three periods of about four weeks punctuated will no grazing for a period of two weeks.

Grazing of domestic stock will be restricted to the use of 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.

The timing of grazing will be strictly controlled to allow native species to grow and set seed over the spring to mid-summer period (DSE 2009). Stock will be excluded from the end of August to the end of January annually, in perpetuity. Table 4 provides targets to be met for ongoing management of grazing within the offset area. The landowner will keep records of the number of sheep and duration of grazing within the offset area. This data will be provided to the TfN on an annual basis. This data and the resultant impact on biomass will provide the basis for an on-going grazing strategy to be approved by the TfN. The grazing exclusion period may be varied by the landowner in response to seasonal conditions, but any variation to the grazing strategy must be approved in writing by TfN.

Table 4. Requirements and limit of grazing activities within the offset area.

Restriction	Target
Exclusion of grazing by domestic stock *	31st August to 31st January annually in perpetuity*
Annual number of pulse grazing cycles*	3
Grazing required prior to exclusion period	15th July to 31st July
Minimum interval between pulse grazing events	2 weeks
Maximum continuous pulse grazing	4 weeks
Biomass management thresholds	Total vegetation cover of no greater than 70%
Target inter-tussock space	Minimum 30% of total site cover

*** Note the duration, timing and exclusion periods for grazing may be varied by TfN in response to seasonal conditions.**

Grazing will occur over a short duration and significantly exceed the standard stocking rate to prevent selective grazing and allow for periods of grazing exclusion. The maximum length of continuous grazing is 4 weeks with at least 2 weeks rest between cycles. Biomass management objectives are that inter-tussock space will be maintained to at least 30% and the total vegetation cover will not fall below 50%. At least 3 pulse grazing cycles will occur within the grazing period, one of which will occur immediately prior to the exclusion period.

The only exception to requirements specified for pulse grazing (Table 4) is if an ecological burn is planned during or following the pulse grazing period. In this instance a fire management plan produced by a qualified contractor will inform when grazing will be removed to allow for a build-up in biomass to establish a burn.

Stock transfer into the offset site will be selected and timed to minimise the potential for weed seed transport via mud, attachment to their fleece or within their faeces (i.e. stock movements into the offset site will be excluded within two days of rainfall and stock new to the farm will be excluded from use in pulse grazing until shorn). This will include using sheep shorn for use in pulse grazing which will otherwise be kept in paddocks with low levels of high threat weeds.

The 9.5 hectare parcel will be monitored during wet periods to prevent excessive soil disturbance in seasonally wet areas. Following any high rainfall events, stock will be removed immediately.

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. The land owner is responsible for ensuring any burning outlined in this OMP can be carried out in a manner compliant with all other government planning requirements and permits.

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 (c.f. 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 area is to be burnt more frequently than every two years. The application of a mosaic burning regime is also considered advantageous and therefore any individual burn will not necessarily 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 3.10.

The extent, intensity and timing of burns must take into account the presence of threatened species, in particular Golden Sun Moth. Fire may kill individuals of this species during the warmer months of the year when they are active above the soil surface. Timing of burns should only be undertaken outside the Golden Sun Moth flight season (generally November to January). However late spring burns can be implemented if less than half of the site is impacted.

Any ecological burns will be conducted during benign (low wind and mild temperature) weather conditions and may be patchy (i.e. not result in the uniform burning of all areas). Patchy burns are a desirable outcome.

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

Actions

- Develop a grazing plan consistent with Table 4 for the offset area, including timing and intensity;
- Exclude grazing during wet periods where ground disturbance would occur;
- Engage a qualified contractor to produce a fire management plan which allows for an ecological burning regime described in the following dot point;
- Undertake ecological burning over the offset area (or parts there-of) up to five times during the 10 year management period. For example at year 1, 3, 5, 7 and 9 or in smaller areas more frequently as directed by a TfN approved fire management plan. Rotate areas burnt so that no area is burnt more frequently than every two years. Note that the use of fire is not a compulsory component of this plan and may also be used at a much reduced scale if considered appropriate (i.e. localised burning of small areas for weed or biomass control);
- When planning burns, liaise with any relevant regulator regarding appropriate planning and permits in a timely manner;
- Plan and conduct ecological burning within different seasons to promote regeneration of a variety of species. However ensure burns consider the ecological needs of any threatened species which may be present (e.g. Golden Sun Moth).

3.9 Monitoring

3.9.1 Baseline Site Condition

While the condition of the broader area of grassland is documented by Biosis (2018), details of the specific matters relating to the selected offset area of 9.5 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.

Within three months of 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.

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).

Five permanent five by five metre monitoring quadrats will be established within the offset site. The minimum of five plots was selected on the basis of the topographic variation present (upper, mid and lower slopes, ridgetops and valley floors) and the variation 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. 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.

A project database will be maintained allowing for data storage and protection, data extraction, quality control, analysis, interpretation, reporting and presentation. The landowner and TfN will have ownership of all data collected, and be responsible for its distribution, availability and licensing to DoEE for compliance and recovery planning and purpose.

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 until 2038.

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 not representative of condition trends across the offset site.

Improving the abundance and cover of Spear-grasses and Wallaby-grasses 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 5 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.

3.9.2 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 5).

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 5). 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 OMPS offset completion criteria. TfN will visit the site a minimum of four times over any 10 year period (at least the spring of years 1, 3, 6 and 10) and will liaise with the land owner annually regarding the development of an annual works plan.

The progress of management works will be inspected by the land owner on a regular basis (at a minimum once every 2 months). The land owner 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 DoEE 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.

3.9.3 Fence monitoring

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.

3.9.4 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 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 three 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/identified 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 (5), 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 established by the botanist 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). These baseline photos will be used to provide a visual document and for monitoring the vegetation response to management until 2038.

3.9.5 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.

More formal monitoring for the presence of pest animals will occur annually in November. This will include a systematic spotlight survey of the offset site lasting no less than one hour. The results of this survey will be included in the annual report to the DoEE.

3.9.6 NTGVVP monitoring

The condition of the NTGVVP will be assessed annually during spring. This will be done using the offset site as a single unit (habitat zone) and using the habitat hectare assessment protocols (DSE 2004).

3.9.7 Golden Sun Moth Monitoring

Monitoring during the flight season for GSM is considered essential for DoEE to be satisfied as to the continued suitability of the site and its management as an offset for impacts to GSM. Baseline monitoring the population of GSM within the offset site will occur in the first flight season after the EPBC Act approval of this OMP (expected to be the 2019/20 flight season). Monitoring will record the location and number of individuals observed along monitoring transects as described below.

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 Shelford.

Monitoring for GSM will occur every second year (i.e. years 2, 4, 6, 8 and 10) during the flight season. While some information on the abundance of GSM within the offset site is provided by Biosis (2018) this survey does not represent four systematic surveys and does not record information relating to habitat condition within the offset. Baseline monitoring data on the distribution and abundance of GSM within the offset site is therefore required to be collected during the 2019/20 flight season. Repeated monitoring of these transects every second year for the duration of this OMP will be conducted to evaluate the persistence and relative abundance of Golden Sun Moth at this site. Ongoing monitoring every second year will then be required until 2038.

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 (2019 /20 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 land owner or TfN will be recorded and reported.

Surveys within the flight season will 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^{o}C, bright, clear days, full sun, absence of rain and wind other than a light breeze) between 10:00 hrs and 15:00 hrs.

Each survey will systematically walk over the entire offset site using two suitably qualified ecologists separated by about 50 metres. Each pair of transects will then be separated by another 50 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 survey is expected to take between 3 and 4 hours 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 DoEE. 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.

3.10 Reporting

Unless otherwise advised by the Minister, the landowner, via the approval holder (ABP), must submit a report annually to TfN and DoEE for the period of the approval (i.e. until 2038). Reports will be submitted at least two months prior to the anniversary date of the execution of the OMP to allow time for compliance to be assessed before the anniversary date. Reports will also be published on the ABP website within 3 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 will 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 5).
- Details of compliance or non-compliance with performance targets (Section 3.4.2).
- 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 7.

3.11 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 DoEE, 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 and final year management period – to audit the implementation and effectiveness of the OMP.
- At the end of year 18 of site management to ensure that the offset completion criteria have been maintained from Year 10 and to the end of the period of approval (September 2038).

The timing of scheduled audits is detailed in Table 7. Additional audits may be triggered as a result of a plan review (Section 3.12) or following an environmental incident resulting in significant change to site conditions, as identified in the risk assessment (Table 6).

3.12 Plan review

This plan includes an adaptive management approach, 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 5.

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

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 offset completion criteria 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 5) for the offset area, an assessment of the risk of failing to achieve desired outcomes (Table 6), and specifies how this relates to the monitoring (Table 7) and reporting (Table 8) program.

Table 5: Management plan actions and timing for offsets on the Thurlgona offset site.

Year No	Objective – Entire offset site	Timing of activity – month(s)	Performance criteria	Related management and monitoring activity (# -see Table 6)
All years	**1. Develop annual works plan.** Ensure the annual works program is appropriately designed and coordinated to achieve short and long term targets.	Completion within 1 month of commencement of this OMP.	TfN approved annual works plan in place	Management Sec. 3.3. 3.7 & 3.8 Monitoring #2 & 3 Sec. 3.9.2
All years	**2. Control 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.	Completion within 1 month of commencement of this OMP.	Control of domestic stock access to offset area. Exclude unauthorised vehicles from offset area. Exclude unauthorised access or unauthorised firewood collection. Maintain fencing around the perimeter of the property to the standard detailed in BushBroker Information Sheet 12 – Standards for Management – Fencing (DSE 2012c) (sheep fencing standard). Any new fences, if required to control threats to ecological values, will be constructed to this standard. Establish posts to mark the boundary of the offset site	Management Sec. 3.8.1 Monitoring #1 - Sec. 3.9.1
All years	**3. Remove all woody weed infestations within the offset area** Weeds to be managed in accordance with BushBroker Information Sheet 8 – Standards for Management – Weeds (DSE 2012b)	Within 1 month of commencement of this OMP.	No mature woody weeds present within offset area after the completion of Year 1. Minimise off-target damage (avoid all native plants) Record and control any woody weed regeneration / re-colonisation New and emerging woody weeds eradicated	Management Sec. 3.8.2 Monitoring #2 - Sec. 3.9.2

Year No	Objective – Entire offset site	Timing of activity – month(s)	Performance criteria	Related management and monitoring activity (# -see Table 6)
All years	**4. Reduce herbaceous weed covers.** Control methods and timing specified in Table 3 and in accordance with DSE (2012b). Establish baseline monitoring sites including quadrats (5) and photo points (5) and reassess annually in late spring.	Refer to Table 3.	Herbaceous weed cover to be less than baseline. Minimise off-target damage (avoid all native plants) Introduced perennial grasses to reduce in cover by at least 50% at the end of 10 years management. Weeds controlled before seed set.	Management Sec. 3.8.3 Monitoring #2 - Sec. 3.9.2
All years	**5. Prevent new and emerging weeds**	Ongoing	New outbreaks of 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. 3.8.2 Monitoring #2 - Sec. 3.9.2
All years	**6. Manage ground cover biomass**	Ongoing	Minimise or exclude grazing from the beginning of September to the end of January 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 30% (+/- 10%) during the GSM flight period. Temporarily fence any burnt area to exclude stock for a minimum of 6 months Ensure no area is burnt more frequently than every 2 years Conduct any burns over a variety of seasons / seasonal conditions	Management Sec. 3.8.5 Monitoring #2 - Sec. 3.9.2
Years 0, 2, 4, 6, 8 and 10	**7. Maintain and enhance Golden Sun Moth population.** Establish baseline monitoring transects and reassess in years 2, 4, 6, 8 and 10 during the GSM flight season. Report on population and habitat condition.	GSM flight season	Document GSM population from 50 metre spaced transects collected four times in each monitoring event. Assess any trends in GSM population size or extent. Document the condition of GSM habitat based on visual assessments.	Management Sec. 3.9.7 Monitoring #2 -

Year No	Objective – Entire offset site	Timing of activity – month(s)	Performance criteria	Related management and monitoring activity (# -see Table 6)
All years	**8. 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. 3.9.1 Monitoring #6
All years	**9. Control Rabbits, Hares and Foxes.** Rabbits to be managed in accordance with BushBroker Information Sheet 7 (DSE 2012a).	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 (excluding natural harbour such as logs and rocks). Rabbit warrens fumigated within three weeks of detection. No active fox dens within offset area, if present they will be destroyed through fumigation and hand collapse. Continue to monitor and control rabbits and foxes all year round.	Management Sec. 3.8.4 Monitoring #3 - Sec. 3.9.5
All years	**10. Improve condition of NTGVVP** Utilise 5 quadrats used for weed monitoring and other general observations.	Spring	Continuous gradual decrease in the cover of weeds Maintenance of an open tussock grassland structure Site condition component of habitat score increases to above 50/75	Management Sec. 3.8.2&4 Monitoring #4 - Sec. 3.9.4&6
All years	**11. Control all new and emerging pest animals.**	Ongoing	Control numbers of any new and emerging pests.	Management Sec. 3.8.4 Monitoring #3 - Sec. 3.9.5
All years	**12. Report on OMP implementation.**	Submit 2 months prior to agreement anniversary date. Annual reporting under this OMP will be aligned with the reporting requirements of the BushBroker Agreement.	Annual report is signed, dated and submitted by the landholder at least 2 months prior to the anniversary date of the agreement, as specified in the BushBroker agreement.	Refer to section 3.10

Table 6 Risk assessment and management

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

Objective (refer to Table 4)	Event or circumstance	Likelihood	Consequence	Risk level	Trigger	Contingency/s	Related monitoring activity (# See Table 7)
2	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	Unlikely	Minor	Low	Domestic stock sighted on offset site out of authorised periods.	Remove stock. Repair fencing. Monitor vegetation.	1
2	Entry of vehicles to offset area. Damage to understorey vegetation, soil compaction.	Unlikely	Minor	Low	Vehicle observed on offset site. Evidence of recent vehicle access e.g. tyre tracks.	Repair fencing. Assess adequacy of fencing.	1
2	Unauthorised access.	Unlikely	Minor	Low	Evidence of firewood collection or physical disturbance observed.	Assess adequacy of fencing.	1
3, 4 & 5	Woody weeds are identified within offset area. Herbaceous weed cover exceeds baseline levels.	Possible	Minor	Low	Woody weeds are detected. Herbaceous weed cover exceeds baseline levels.	Control weeds. Minimise off-target damage (avoid all native plants)	2
10, 11	Pest animals observed within offset site. Damage to understorey vegetation or recruiting trees and shrubs.	Possible	Moderate	Medium	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.	Destroy fox dens and rabbit warrens through fumigation and hand collapse. Undertake control works for new and emerging pests as appropriate.	3

Objective (refer to Table 4)	Event or circumstance	Likelihood	Consequence	Risk level	Trigger	Contingency/s	Related monitoring activity (# See Table 7)
7	GSM population drops significantly	Possible	Critical	Severe	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. Review plan.	5
8	Failure to attain habitat completion criteria for GSM & NTGVVP	Possible	Critical	Severe	Habitat completion criteria assessed as unlikely to be achieved as at year 8 of OMP implementation.	Engage DoEE to determine suitable additional offsets.	5
7 & 8	Failure to maintain completion criteria for GSM habitat and NTGVVP	Unlikely	Critical	Severe	Habitat condition for GSM and NTGVVP declines after ten years	Review intensity of management inputs and implement more intensive management as required to reinstate completion criteria	5
1, 2, 3, 4, 5, 6, 7, 8, 9	Wildfire or uncontrolled planned burn. May impact temporarily or permanently on natural regeneration. May impact upon weed recruitment patterns. May destroy fencing.	Possible	Medium	Medium	Wildfire observed within offset area.	Monitor for increased weed invasion (immediately post fire and 12 months post fire). Undertake weed control works to take advantage of new growth. Inspect fence condition and repair any damage. Significant wildfire throughout the majority of the offset area is a trigger for plan review (Section 3.12).	1, 4

Table 7 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 3.8.1 and 3.9.3 for details.	Offset site perimeter	Quarterly	High
2	Weed monitoring	Cover of woody and herbaceous weed species.	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 3.8.2, 3.8.3 and 3.9.4 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 3.8.4 and 3.9.5 for details.	Offset area.	Annual – Spring During vegetation condition survey	High
4	Golden Sun Moth population monitoring	Number of GSM observed. Subjective condition of habitat	Refer to Section 3.9.7 for details.	Offset area.	GSM flight season	High
5	Golden Sun Moth habitat condition monitoring	Condition of habitat (VQA related parameters)	Refer to Section 3.9.1 for details.	five permanent plots.	Annual – Spring (part of weed monitoring).	High
6	NTGVVP condition monitoring	VQA Condition parameters	Refer to Section 3.9.6 for details.	Offset area	Annual – Spring During vegetation condition survey	High

Table 8 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 3.10).	3e & 8	Offset site owner	Report to be completed by August 31 so information is available prior to spring monitoring.	DoEE TfN ABP	Not Applicable
2	Annual monitoring report. Presents results of offset site monitoring activities (Section 3.10).	3	Offset site owner	Annual monitoring to be completed in spring. Report to be completed by November 30 of each year.	DoEE TfN ABP	Completion of annual monitoring
3	Review of offset management plan (Section 3.12).	3	ABP	As required.	DoEE TfN	Significant environmental event causing widespread impact to habitat within the offset site e.g. Wildfire.
4	NTGVVP condition	3	ABP	Annual monitoring to be completed in spring.	DoEE TfN	Not Applicable
5	GSM population and habitat condition assessment.	3	Ecologist	Annual compliance report to DoEE.	DoEE TfN ABP	Baseline population information in 2019/20 flight season. Biennial during flight season thereafter. Completion of annual habitat assessment using 15 monitoring plots.
6	Audit report (Section 3.11).	3 & 10	Approval holder (ABP)	End of years 1, 4, 8 and 10.	DoEE	Not Applicable

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Appendices

Appendix 1

A2.1 Plant species (24 native and 25 weeds) recorded within Lot 4 of LP4563, Shelford

Rare or threatened species status:

Victorian status: (DEPI 2014)

v	vulnerable
r	rare
P	Protected under the FFG Act

Noxious weed status:

RR	Regionally restricted species
RC	Regionally controlled species

Status	Scientific Name	Common Name
Indigenous species		
P	*Acacia mearnsii*	Black Wattle
	Acacia melanoxylon	Blackwood
	Acaena echinata	Sheep's Burr
	Anthosachne scabra s.s.	Common Wheat-grass
	Austrostipa bigeniculata	Kneed Spear-grass
P	*Calocephalus citreus*	Lemon Beauty-heads
P	*Chrysocephalum* sp. 1	Plains Everlasting
	Convolvulus angustissimus subsp. *angustissimus*	Blushing Bindweed
k	*Convolvulus angustissimus* subsp. *omnigracilis*	Slender Bindweed
L, P, e	*Cullen parvum*	Small Scurf-pea
	Dichondra repens	Kidney-weed
	Eryngium ovinum	Blue Devil
	Juncus subsecundus	Finger Rush
P	*Leptorhynchos squamatus*	Scaly Buttons
	Melicytus dentatus s.s.	Tree Violet
	Microlaena stipoides var. *stipoides*	Weeping Grass
	Oxalis perennans	Grassland Wood-sorrel
	Poa labillardierei	Common Tussock-grass
	Poa morrisii	Soft Tussock-grass
	Poa sieberiana var. *sieberiana*	Grey Tussock-grass
	Rumex brownii	Slender Dock
	Rumex dumosus	Wiry Dock
	Schoenus apogon	Common Bog-sedge
	Themeda triandra	Kangaroo Grass
Introduced species		
	Agrostis capillaris	Brown-top Bent
	Aira spp.	Hair Grass

Status	Scientific Name	Common Name
	Anthoxanthum odoratum	Sweet Vernal-grass
	Avena barbata	Bearded Oat
	Briza maxima	Large Quaking-grass
	Briza minor	Lesser Quaking-grass
	Bromus hordeaceus subsp. *hordeaceus*	Soft Brome
RR	*Carthamus lanatus*	Saffron Thistle
RR	*Cirsium vulgare*	Spear Thistle
	Cynosurus cristatus	Crested Dog's-tail
	Dactylis glomerata	Cocksfoot
	Holcus lanatus	Yorkshire Fog
	Hypochaeris radicata	Flatweed
	Leontodon taraxacoides subsp. *taraxacoides*	Hairy Hawkbit
	Lolium rigidum	Wimmera Rye-grass
	Lophopyrum ponticum	Tall Wheat-grass
	Phalaris aquatica	Toowoomba Canary-grass
	Plantago lanceolata	Ribwort
	Romulea rosea var. *australis s.s.*	Common Onion-grass
RC	*Rosa rubiginosa*	Sweet Briar
	Rubus anglocandicans	Common Blackberry
	Trifolium angustifolium var. *angustifolium*	Narrow-leaf Clover
	Trifolium dubium	Suckling Clover
	Trifolium spp.	Clover
	Vulpia bromoides	Squirrel-tail Fescue

Appendix 2

A4.1 DoEE 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

Appendix 3

A3.1 Glossary

This appendix contains definitions of technical terms used in this OMP.
Items marked with an asterisk (*) are cited from DELWP (2007b)

Benchmark*

A standard vegetation –quality reference point, dependent on vegetation type, which is applied in Habitat hectare assessments. Represents the average characteristics of a mature and apparently long undisturbed state of the same vegetation type.

Biodiversity*

The variety of all life forms, the different plants, animals and microorganisms, the genes they contain, and the ecosystems of which they form a part.

Bioregion*

Biogeographic areas that capture the patterns of ecological characteristics in the landscape or seascape, providing a natural framework for recognising and responding to biodiversity values. A landscape based approach to classifying the land surface using a range of environmental attributes such as climate, geomorphology, lithology and vegetation.

BushBroker

A program coordinated by DELWP to match parties that require native vegetation offsets with third party suppliers of native vegetation offsets.

Ecological vegetation class (EVC)*

A native vegetation type classified on the basis of a combination of its floristic, life form, environmental and ecological characteristics.

EPBC Act

Environmental Protection and Biodiversity Conservation Act 1999

Gain

Predicted improvement in the contribution to Victoria's biodiversity achieved from an offset, calculated by combining site gain with the strategic biodiversity score or habitat importance score of the site. Gain is measured with biodiversity equivalence scores or units.

Habitat hectares*

Combined measure of condition and extent of native vegetation. This measure is obtained by multiplying the site's condition score (measured between 0 and 1) with the area of the site (in hectares).

Habitat score*

The score assigned to a habitat zone that indicates the quality of the vegetation relative to the ecological vegetation class benchmark – sum of the site condition score and landscape context score, usually expressed as a percentage or on a scale of 0 to 1.

Habitat zone*

A discrete area of native vegetation consisting of a single vegetation type (EVC) within an assumed similar quality. This is the base spatial unit for conducting a Habitat hectare assessment. Separate *Vegetation Quality Assessments* (or Habitat hectare assessments) are conducted for each habitat zone within the designated assessment area.

Indigenous vegetation*

The type of native vegetation that would have normally been expected to occur on the site prior to European settlement.

Offset*

Protection and management (including revegetation) of native vegetation at a site to generate a gain in the contribution that native vegetation makes to Victoria's biodiversity. An offset is used to compensate for the loss to Victoria's biodiversity from the removal of native vegetation.

Offset Management Plan (OMP)

A document which sets out the requirements for establishment, protection and management of an offset site.

Site

An area of land that contains contiguous patches of native vegetation or scattered trees, within the same ownership.

Site gain

Predicted improvement in the condition, or the condition and extent, of native vegetation at a site (measured in Habitat hectares) generated by the landowner committing to active management and increased security.

Recruitment*

The production of new generations of plants, either by allowing natural ecological processes to occur (regeneration etc.), by facilitating such processes such as regeneration to occur, or by actively revegetating (replanting, reseeding). See Revegetation.

Remnant vegetation*

Native vegetation that is established or has regenerated on a largely natural landform. The species present are those normally expected in that vegetation community. Largely natural landforms may have been subject to some past surface disturbance such as some clearing or cultivation (or even the activities of the nineteenth century gold rushes) but do not include man-made structures such as dam walls and quarry floors.

Understorey*

Understorey is all vegetation other than mature canopy trees – includes immature trees, shrubs, grasses, herbs, mosses, lichens and soil crust. It does not include dead plant material that is not attached to a living plant. More information on understorey life forms is set out in the Vegetation Quality Assessment Manual (DSE 2004).