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# Woodland Reserve Management Plan, 285 Donnybrook Road, Mickleham

## Prepared for AMP Capital

Katherine Whittaker, Karl Just, David Fairbridge, Richard Francis and Kathy Himbeck

Report 0725-3, Version 1.5
April 2017

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# 1 Introduction

Abzeco Pty Ltd was commissioned by AMP Capital to produce a Reserve Management Plan providing a basis for the on-going management of reserved land (47 hectares) at 285 Donnybrook Road, Mickleham. Works specifically associated with this plan commenced at the beginning of 2014. Conditional approval for development of land at 285 Donnybrook Road is has been provided by the Department of Environment (DoE) in relation to implications for the proposal under the Environment Protection and Biodiversity Conservation (EPBC) Act 1999 (see Appendix 1). This plan is intended to satisfy the DoE requirement for reserved land within the property to be designated an advanced Offset under the EPBC Act for the nationally endangered Golden Sun Moth *Synemon plana* and to satisfy commitments and requirements for registration of offsets on the states Native Vegetation Credit Register.

This plan informed through site assessments undertaken on-foot over a number of years is into its second year and and is to be implemented over a ten year management period from the date of approval. After the initial five year management period, the plan is to be revised and amended to reflect changes in environmental conditions and adaptive management with improving vegetation condition. A second review is required at the end of the initial 10 year management period.

The plan provides a detailed description of the restoration works and ongoing management considered necessary to maintain and improve the quantity and quality of indigenous vegetation and maintain existing habitat values for the Golden Sun Moth (GSM) within the site.

Key management aims and objectives detailed in this Reserve Management Plan include:

- To maintain and enhance the biodiversity of the reserve through active vegetation management;
- To control threats to the native flora and fauna, including from pest plants and animals;
- To improve the quantity and quality of indigenous vegetation on the land through targeted restoration works;
- To monitor, maintain and enhance habitat for Golden Sun Moth *Synemon plana*, known to be present within the site, and;
- Enhance landscape amenity values.

In addition habitat zones 1 and 2 are secured under an agreement with the Native Vegetation Credit Register and must be managed to meet specific standards as outlined in this management plan.

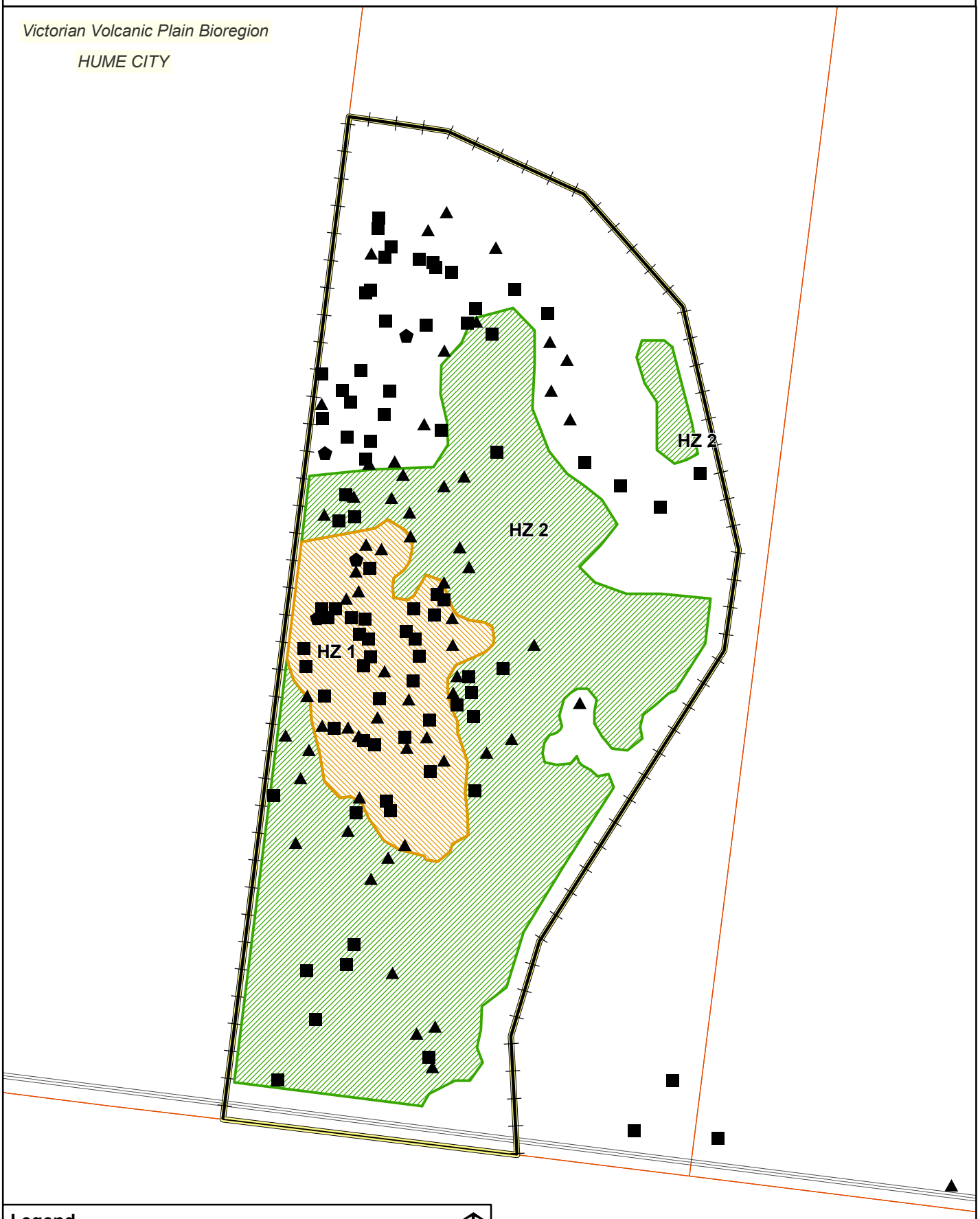
# 2 Credit Site Details

| | |
|---|---|
| **Address of credit site** | Reserve No.1, 285 Donnybrook Road Mickleham |
| **Land tenure** | Public Conservation and Resource Zone |
| **Assessor details** | |
| **Site assessor** | Abzeco Pty Ltd |
| **Assessment date** | |
| **Credit details** | |
| **Credit identifier** | BB-3009 |
| **Number of sites**(s) | 1 |
| **Number of zone**(s) | 2 |
| **Total area of sites** (ha) | 30 hectares |
| **Asset type** | Protection of remnant vegetation |

| **Habitat zone details** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Asset Type *** | RP | RP | | | | | |
| **Habitat zone number** | HZ1 | HZ2 | | | | | |
| **Habitat zone area** (ha) | 24 | 6 | | | | | |

Figure 1 provides a zone plan of the property showing the location of the site and management zones in relation to the parcel of land.

# Figure 1. Zone Plan of Credit Site Zones for Woodland Reserve, Donnybrook Rd, Mickleham.




**Legend**

- Large-old Tree
- Very Large-old Tree
- Medium-old Tree

**Credit Zone**

- Plains Grassy Woodland
- Plains Swampy Woodland
- Existing Fences
- Woodland Reserve
- Roads
- Contour (1m)
- Drainage Line
- Transmission Line
- Cadastre

100 50 0 100 200
Meters

GDA 1994 MGA Zone 55

Note: location of property boundaries and watercourse indicative only Scale 1:6,000 (A4)

Date created: 18 June 2015

Created by : Kathy Himbeck

File: J:\Jobs\0725_Jobs\0725 2014/CreditRegister/Donnybrook BBMPAbzecoFig1July2015_V1

Abzeco Pty. Ltd
Suite 1, 4 Brisbane Street
Eltham, Victoria 3095
Ph 03 9431 5444
www.abzeco.com.au

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## 2.1 Background

The offset site is a 47 hectare reserve set aside from surrounding development for conservation purposes at 285 Donnybrook Road, Mickleham (see Figures 2a –b and 2a-b). Approximately 40km north of Melbourne, the site lies within the Victorian Volcanic Plains bioregion on the Merri Creek Plains and adjoins the established Mount Ridley Nature Conservation Reserve to the south. The reserve is part of the regionally significant Mickleham Red Gum Woodland area.

The Woodland Reserve supports two broad vegetation types, Plains Swampy Woodland and Plains Grassy Woodland (see Figures 2a and 2b), and is of national conservation significance for supporting habitat (36.6ha) for and a large population of the nationally endangered Golden Sun Moth *Synemon plana (*see Figures 2a and 2b).

As part of an amendment to the Hume Planning Scheme in 2008 (Amendment C98), the present reserve was rezoned Public Conservation and Resource Zone (PCRZ) to satisfy a requirement for public protection and management (figures 2a-b and 2a-b show the reserve boundary which determined the PCRZ extent; the PCRZ allows a small buffer along the actual fenced reserve boundary). A condition of the amendment is that the reserve be transferred to the state and managed by a public authority prior to the commencement of any works within the development zone on the balance of land.

Funding for works as outlined in this 10 year management plan will be solely provided by the proponent, AMP Capital.

## 2.2 Previous Land Use, Disturbance History and Current Site Condition

The entire property at 285 Donnybrook Road, which incorporates the present reserve, has a long history of agricultural land use, including grazing and cultivation. Presence of the now dilapidated bluestone 'Newland Ruin' in the northeast of the site, thought to be a pastoral residence built in the 1850's, suggests farming of the land has occurred for over 160 years. Historical agricultural land use has caused significant negative disturbance including direct clearance of vegetation, 'pugging' of wetter areas by cattle, basalt rock removal and replacement and the introduction of exotic herbs and grasses. In recent years grazing pressure within the reserve has been reduced and more closely managed, primarily through the establishment of farm-style fencing in 2007 to delineate the reserve boundary and restrict stock access.

The reserve was fenced in 2011 and managed grazing continued up until the summer of 2013/2014. The reduction in pressure resulted in recovery of some woodland flora species, including significant canopy tree regeneration, but has also encouraged the proliferation of exotic grass species. With no evidence of biomass management through fire or other means in recent years, which would have ameliorated vegetation changes with grazing removal, recovery of indigenous ground flora has been somewhat hindered.

### *Current Site Condition*

Vegetation within the reserve varies, from drier exotic grass-dominated woodland in the east and north, to high quality Plains Swampy Woodland (see Figures 2a and 2b) in the central area and a moderately degraded grassy rise across the south.

Since the provision of stock management fencing in 2007, Grassy Woodland vegetation within the reserve has made a notable shift towards recovery. Since 2007, limited numbers of stock has had periodic access to the site for the purpose of biomass control and management of eucalypt regeneration. Stock have been excluded since the summer of 2013/2014. The site is characterised by flat to undulating plains with sparse cover of canopy trees and stags. Eucalypt regeneration is extensive with large patches of saplings present across the reserve, however the mid strata has been effectively expunged with the long history of cattle grazing. Understorey floristic communities vary across the site but are dominated by expanses of Tussock Grass, Kangaroo Grass and exotic grasses. Woody weeds within the reserve are mostly limited to those that occur at the base of large trees, namely Boxthorn and Artichoke Thistle.

Large areas through the centre of the site exhibit strong 'gilgai' formation that become inundated seasonally and have persisted despite soil compaction or 'pugging' that readily occurs with cattle activity. Soils within the site are heavy black, poorly drained clays that have shown a tendency to shrink, swell and crack in response to wetting and drying cycles within the site.

Golden Sun Moth have been recorded across the site[1] with good habitat present in the drier woodland areas across the north, through the centre (excluding the Poa-dominated Swampy Woodland area) and across the open exotic-grass dominated rise in the south.

[1] Abzeco (2013) '*Targeted Golden Sun Moth Synemon plana survey for land at 225 and 285 Donnybrook Road, Mickleham, Victoria.* Abzeco Pty Ltd, Eltham, Victoria.

# 3 Biodiversity Assessments under the Native Vegetation Permitted Clearing Regulations

The Biodiversity Assessment Guidelines, *Permitted Clearing of Native Vegetation – Biodiversity Assessment Guidelines* (DEPI 2013), seeks to ensure permitted clearing of native vegetation results in no net loss in the contribution made by native vegetation to Victoria's biodiversity. Assessment of the 'Risk-based Pathway' and, where appropriate, a Vegetation Quality Assessment is integral to achieving no net loss. The 'Habitat Hectare Assessment' method has been developed to accompany the Biodiversity Assessment Guidelines;

> **No net loss** - An outcome where a particular gain in the contribution to Victoria's biodiversity is equivalent to an associated loss in the contribution to Victoria's biodiversity from permitted clearing.
>
> **Habitat hectare assessment** - A site-based measure of the condition of native vegetation with reference to the **benchmark** for the same type of native vegetation. The assessment generates a condition score of between 0 and 1.
>
> Definitions sourced from DEPI, 2013.

## 3.1 Criteria of the Biodiversity Assessment Guidelines

In accordance with the Biodiversity Assessment Guidelines, native vegetation is defined by two categories; remnant patches and scattered trees, as outlined below.

*Remnant patch*

A remnant patch of native vegetation is either:

- an area of vegetation where at least 25 per cent of the total perennial understory plant cover is native
- any area with three or more native canopy trees where the canopy foliage cover is at least 20 per cent of the area.

*Scattered tree*

A scattered tree is:

- a native canopy tree that does not form part of a remnant patch

## 3.2 Habitat Quality of the Offset Area

Provided in this section is the habitat hectare quality and calculation of offsets available within the reserve. Following assessments conducted by Abzeco, the reserve support areas of 'intact' Plains Grassy Woodland and Plains Swampy Woodland. Results of the assessment are provided in Table 1. Table 2 provides gain scoring for on title protection, maintenance and improvement gains in the offset site.

**Table 1. Habitat hectare scores within the reserve at 285 Donnybrook Road, Mickleham**

| **Habitat Zone** | | | 1 | 2 |
|---|---|---|---|---|
| **Benchmark criteria** | | **Max. Score** | **EVC name and number**<br><br>Plains Grassy Woodland (EVC 51-61) | **EVC name and number**<br><br>Plains Swampy Woodland (EVC 651) |
| Site condition | Large Trees | 10 | 3 | 6 |
| | Tree Canopy Cover | 5 | 5 | 5 |
| | Understorey | 25 | 15 | 20 |
| | Lack of Weeds | 15 | 6 | 6 |
| | Recruitment | 10 | 5 | 5 |
| | Organic Litter | 5 | 5 | 5 |
| | Logs | 5 | 5 | 5 |
| Multiplier (1X) | | 1x | **44** | **52** |
| Landscape value | Patch Size | 10 | 8 | 8 |
| | Neighbourhood | 10 | 6 | 6 |
| | Distance to Core Area | 5 | 4 | 4 |
| **Habitat quality score** | | **100** | **62** | **70** |
| Habitat score as above = #/100 | | 0.## | 0.62 | 0.70 |
| **Bioregion** | | | **Victorian Volcanic Plain** | **Victorian Volcanic Plain** |

**Table 2. Gain scoring for maintenance and improvement within the reserve at 285 Donnybrook Road, Mickleham**

| **OFFSET IDENTIFIER** | | | Offset Zone 1 (HZ1) | | | Offset Zone 2 (HZ2) | | |
|---|---|---|---|---|---|---|---|---|
| **EVC Number** | | | 51_61 | | | 651 | | |
| **EVC name** | | | Plains Grassy Woodland | | | Plains Swampy Woodland | | |
| Current habitat score of zone | | 0.## | 0.62 | | | 0.7 | | |
| Conservation Significance | | | Very High | | | Very High | | |
| | | Possible Score | Current Score | Maintenance | Improvement | Current Score | Maintenance | Improvement |
| **Site Condition** | Large Old Trees | 10 | 3 | 0.75 | na | 6 | 0 | |
| | Canopy Cover | 5 | 5 | 0.25 | 0 | 5 | 0 | 0 |
| | Understorey | 25 | 15 | 1.5 | 2.5 | 20 | 1.5 | 2.5 |
| | Lack of Weeds | 15 | 6 | na | 2 | 6 | | 2 |
| | Recruitment | 10 | 5 | 0.5 | 2 | 5 | 0 | 2 |
| | Organic Matter | 5 | 5 | 0.5 | 0 | 5 | 0.5 | 0 |
| | Logs | 5 | 5 | 5 | 0 | 5 | 5 | 0 |
| Maintenance & improvement totals | | #.# | | 8.5 | 8.5 | | 7 | 6.5 |
| Additional Gains | | #.# | | | | | | |
| Total gain for Maintenance & Improvement | | ##.# | | 17 | | | 13.5 | |
| Prior Management Gain | | #.# | | 6.2 | | | 7 | |
| Improved Security Gain | | #.# | | 6.2 | | | 7 | |
| Total gain points /100 | | ##.# | | **29.4** | | | **27.5** | |
| Rate of gain per hectare - HHA/ha | | 0.## | | **0.29** | | | **0.27** | |
| Area of the Offset Area (Ha) | | #.# | | 24 | | | 6 | |
| Gain available (HabHa) | | #.## | | **6.96** | | | **1.62** | |
| 'Large-old' trees available for protection | | # | | | | | | |

## 3.3 Biodiversity Equivalence Units

Permitted vegetation removal may require offsetting under provisions of Biodiversity Assessment Guidelines. Vegetation loss is represented as General Biodiversity Equivalence Units. These units are currently generated by data exchange between the assessor (Abzeco) and DELWP, and are calculated by applying the following attributes:

- The Habitat Hectare Score (the area of vegetation loss x the site condition score)
- Strategic Biodiversity Score (using the Strategic Biodiversity Map),
- The General Biodiversity Equivalence Score (Habitat Hectares x Strategic Biodiversity Score).

An Offset Site Report has been generated from DELWP (provided in Attachment 1) and provides information about native vegetation of the offset site in accordance with the *Permitted clearing of native vegetation – Biodiversity assessment guidelines*. The information in the report is based on spatial information, condition score and available site gains in habitat hectares that Abzeco have provided. A summary of the offsets available on the site are provided in Table 3. For full details of the offsets available for the site refer to Attachment 1 (Offset Site Report).

**Table 3. Offsets available at 285 Donnybrook Road, Mickleham**

| **General Information** | |
|---|---|
| **Offset type** | Remnant |
| **Total extent of offset** | 29.523 ha |
| **Number of biodiversity class areas (BCAs)** | 9 |
| **Strategic Biodiversity Score** | Various, per BCA (refer to attached Offset Site Report) |
| **Catchment Management Authority and Municipal District** | Port Phillip and Westernport CMA, Hume City Council |
| **Biodiversity Equivalence Units Available** | |
| General biodiversity equivalence units | 3.239 general units |
| Specific biodiversity equivalence units | 5.802 specific units of habitat for Striped Legless Lizard |
| | 6.443 specific units of habitat for Golden Sun Moth |
| | 6.588 specific units of habitat for Clover Gylcine |
| | 1.299 specific units of habitat for Plump Swamp Wallaby-grass |
| | 5.657 specific units of habitat for Pale Swamp Everlasting |
| | 3.346 specific units of habitat for Matted Flax-lily |

# 4 Landowner Management Commitments

## 4.1 Ongoing Management Commitments

From the commencement of the agreement, the landowner agrees to undertake the following ongoing management commitments on Credit Registered Zones (HZ1 & HZ2) in perpetuity.

| **Ongoing management commitments** | |
|---|---|
| Habitat zone(s) | Commitment |
| All | From the commencement of the agreement the landowner must, for all vegetation types:<br>• eliminate all woody weeds < 1 % cover,<br>• ensure that weed cover does not increase beyond the current level<br>• monitor for any new and emerging weeds and eliminate to < 1% cover<br>• control rabbits |
| | For woody vegetation, the landowner must also:<br>• retain all standing trees (dead or alive)<br>• retain all logs and fallen timber<br>• exclude stock |

## 4.2 10 Year Management Commitments

The landowner agrees to undertake the following management commitments for a period of 10 years from the commencement of the agreement.

| **10 year management commitments** | |
|---|---|
| Habitat zone(s) | Commitment |
| HZ1 & 2 | • Maintain fencing around boundary of all sites in good condition according to the standards detailed in information sheet 12 Standards for Management – Fencing (Table 1) |
| HZ1 & 2 | • Elimination of all woody weeds (Table 2) |
| HZ1 & 2 | • Control of all herbaceous weeds (see Table 3) |
| HZ1 & 2 | • Monitor and control new and established pest animals (Table 5) |
| | • Monitor, maintain and enhance habitat for Golden Sun Moth *Synemon plana* |
| | • Maintain accurate records substantiating all actions taken to implement this management plan |
| | • Provide an annual summary to the approval holder of all actions taken and monitoring data collected to implement this management plan |

# 5 Woodland Reserve Management Plan

The Mickleham Woodlands site will require ongoing active management to prevent any decline in the quality and condition of vegetation and to maintain and enhance habitat values for the Golden Sun Moth and other flora and fauna. This will mostly depend upon grassy biomass management through the use of fire or alternative management practices that can create similar results (see below). In any case, there will be a requirement for a consistent and ongoing weed control program.

The presence of cattle within the site has had various effects on the vegetation. Observations by Abzeco ecologists over the last seven years have shown that the wetter sections that carry a high cover of Basalt Tussock-grass *Poa labillardierei* (volcanic plains) and wetland herbs have been significantly impacted by pugging, trampling and over-grazing. However, with the permanent removal of grazing, there are four main threatening processes that are likely to intensify and will be a priority focus for management:

- increase in weed growth, particularly of perennial grasses such as Chilean Needle-grass **Nassella neesiana* and Toowoomba Canary-grass **Phalaris aquatica*;
- excessive recruitment of eucalypt seedlings (mostly River Red Gum);
- increased chance of severe grass fires which could kill the old growth River Red Gum canopy (note that the Mickleham Road fire in autumn 2014 killed many old River Red Gums not far from the site to the south-west); and
- excessive growth of native grasses, which could render extant GSM habitat unsuitable for the species .

## 5.1 Reserve Management Areas and Specific Management Plan Objectives

Key management aims and objectives detailed in this Reserve Management Plan include:

- To maintain and enhance the biodiversity of the reserve through active vegetation management;
- To control threats to the native flora and fauna, including from pest plants and animals;
- To improve the quantity and quality of indigenous vegetation on the land through targeted restoration works;
- To monitor, maintain and enhance habitat for Golden Sun Moth S*ynemon plana*, known to be present within the site,
- Enhance landscape amenity values and
- Avoid any works within the vicinity of the Newland Ruins, which have cultural heritage value (see figures 1-2)

### *Management area 1*

Description: this area includes the core area of Plains Swampy Woodland. Most of the area has a strong 'gilgai' soil profile and carries a high cover of Basalt Tussock-grass *Poa labillardierei* (volcanic plains), wetland herbs, sedges and grasses. It is one of the best known examples of the EVC in the Greater Melbourne area.

Management: Biomass management is unlikely to be a significant issue in this unit due to the absence of GSM and the dominance of Poa that does not produce the high level of thatch that other grasses do (particularly Kangaroo Grass). Regular inundation of the gilgai areas and the presence of self-mulching clays are also factors that are likely to reduce biomass levels.

Due to the removal of stock, grassy weeds and eucalypt seedlings will require management by experienced bushland managers. Eucalypt seedlings should be brush-cut every 1-2 years or when deemed appropriate (accepting a small amount that are protected to grow to mature trees). It is important that this is implemented before seedlings become too large and/or dense to control. Toowoomba Canary-grass, Chilean Needle Grass and Artichoke Thistle will require control via regular spot-spraying. Boxthorn, which are currently scattered beneath the trees, will require control via cut-paint.

### *Management area 2*

Description: this includes the slight rise in the southern section that carries areas with good quality understorey dominated by Wallaby-grasses, Kangaroo Grass and bryophytes. It also includes the eastern and northern sections of the site that carry a combination of weed dominated areas in mosaic with patches of Poa and other grasses. This unit includes the core habitat for GSM.

Management: this unit will require ongoing biomass management to prevent excessive growth of native and exotic grasses, which would not only degrade the vegetation but would probably render the habitat unsuitable for GSM. The preferred management option is for regular burning, at a frequency of every 3-5 years.

## 5.2 Timing and Review

Implementation of this plan commenced at the beginning of 2014 with the remaining actions required to be adhered to for the 10 year management period. Where considered necessary, management actions should be site-responsive and amended to reflect changes in environmental conditions within the site, or in the instance of new information being obtained as a result of monitoring and review activities. A revised management plan must be developed within ten years of the commencement of construction in accordance with conditional approval under the EPCB Act (see Appendix 1).

## 5.3 Management Responsibilities and Site Security

The Department of Environment (DoE) will approve this plan and oversee implementation of management actions for the duration of the 10 year management period in conjunction with the Department of Environment, Land, Water and Planning (DELWP). The site will be transferred to Crown Land in the initial stages of the management period (proposed for late 2015) with responsibility remaining with the proponent, AMP Capital, until that time. Management actions will be undertaken by qualified and experienced land managers.

All works undertaken within the 10 year management period will be funded by the proponent, AMP Capital. A number of initial tasks such as new fencing, prescribed burning, fuel break establishment and dam filling have been completed as a conidtion of to handover to the State.

### *Project Supervision & Monitoring Program*

A monitoring program suitable for the duration of the project has been devised (section 4.2). This includes the determination of key performance criteria, monitoring parameters, assessment protocols and baseline data collection at the study site.

Each monitoring action will include:

- data collection on environmental attributes
- inspection of habitat protection measures
- implementation of appropriate responses to site assessments
- annual monitoring of golden sun moth
- reporting on project outcomes

Any deviations or failures to meet the Management Plan objectives will be reviewed and addressed via adaptive management measures to ensure objectives are satisfactorily met within the 10 year management period.

Project monitoring results will be made available to relevant stakeholders upon request. Parks Victoria as appointed land manager must ensure compliance with approval conditions relevant to the conservation reserve and its management with monitoring and implementation results provided to the approval holder annually (see Appendix 1).

**Figure 2a. Vegetation Communities & Notable Features, Woodland Reserve, Donnybrook Rd, Mickleham**


**Legend**

- Plains Grassy Woodland & GSM Habitat
- Plains Swampy Woodland
- Woodland Reserve (Fenced)
- Newland Ruin
- Rocky Area
- Farm Fencing
- Transmission Line

50 25 0 50 100 150 200 Meters

Note: location of property boundaries, watercourse and topography indicative only

Scale 1:6,000 (A4)

Date Created: 31st July 2014

Created by : Katherine Whittaker

File: J:\Jobs\2007_Jobs\0725_DonnybrookRdMickleham_Abzeco Fig1-OMP_Oct2014V1.0

Abzeco Pty. Ltd
Suite 1, 4 Brisbane Street
Eltham, Victoria 3095
Ph 03 9431 5444
www.abzeco.com.au

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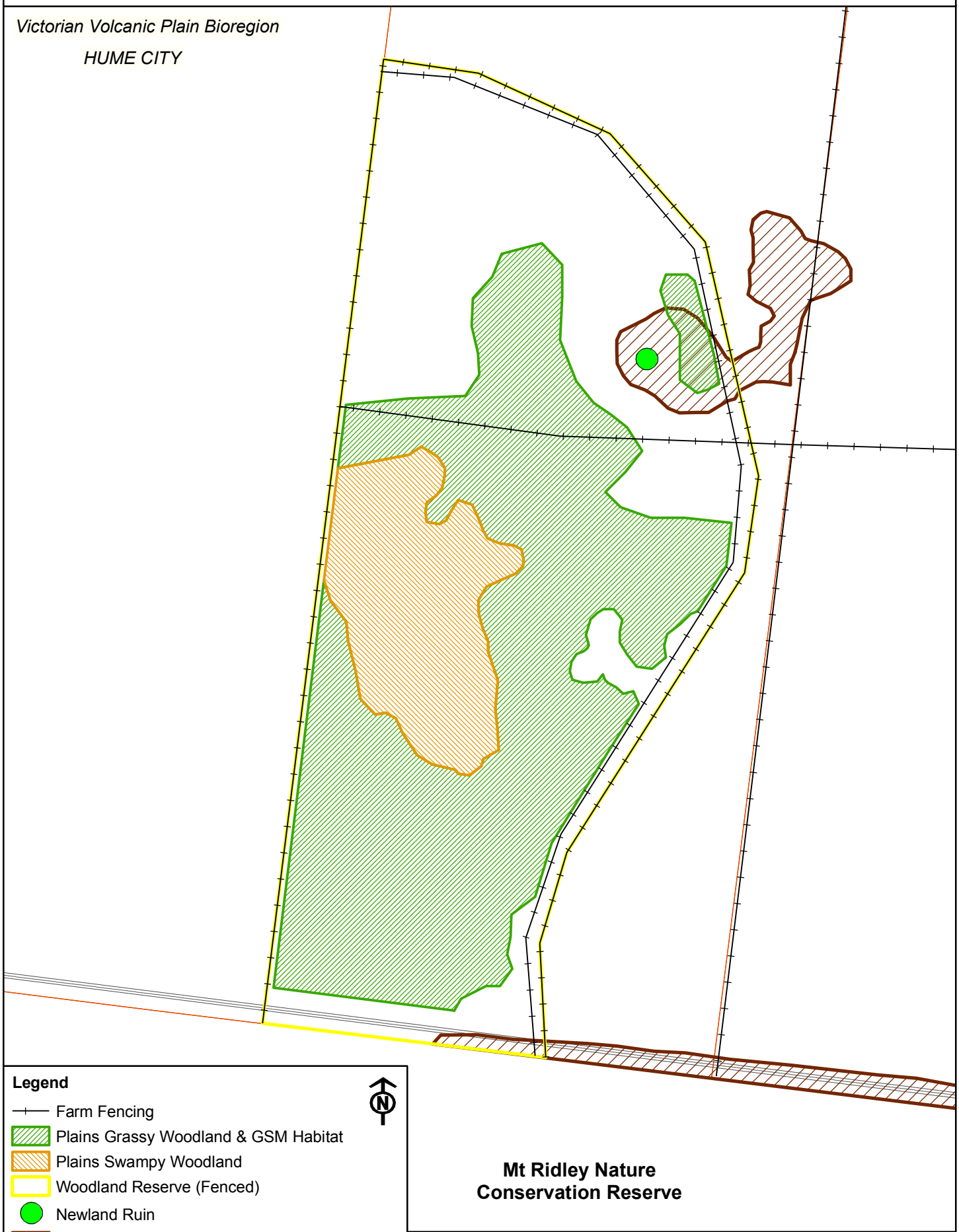
**Figure 2b. Vegetation Communities & Notable Features, Woodland Reserve, Donnybrook Rd, Mickleham**




Date Created: 31st July 2014

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Abzeco Pty. Ltd
Suite 1, 4 Brisbane Street
Eltham, Victoria 3095
Ph 03 9431 5444
www.abzeco.com.au

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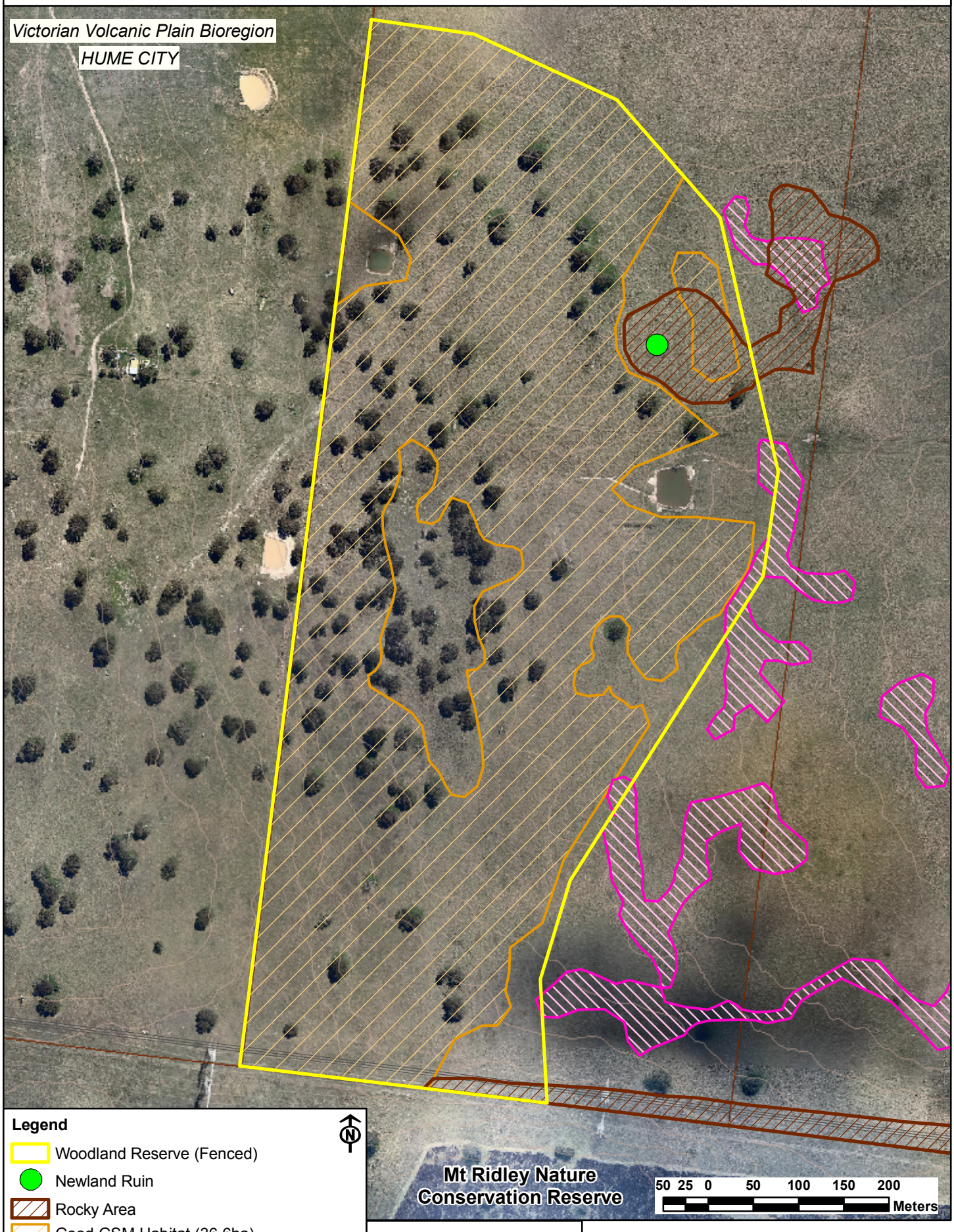
## 5.4 Golden Sun Moth Survey

The extent of golden sun moth habitat in the reserve was determined through targeted survey during the 2013/2014 and 2014/2015 flight seasons to inform the Reserve Management Plan in accordance with conditional approval from the Department of Environment (DoE) EPBC Act referral 2013/6913. The location of records was entered into a gps device and mapping is provided in figures 3a & 3b on the following pages. Note the table below includes incidental observations made by Abzeco staff while undertaking other management activities.

| Date | Survey duration | Time | # Males | # Females | Temp (on site) | Cloud cover % | Wind direction | Average Wind speed | Ground conditions | Humidity | Vegetation description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 29/10/2015 | 5 | 11:00 | 12 | 0 | 26 | 5 | NE-NW | 8 | Dry | 35 | *Nassella neesiana, Rytidosperma* spp., *Vulpia*, *Anthoxanthum odoratum, Poa Lab, Themeda* |
| 16/11/2015 | 1 | 11:12 | 12 | 0 | 26 | 10 | NW | 10 | Dry | 30 | *Nassella neesiana, Rytidosperma* spp., *Vulpia*, *Anthoxanthum odoratum, Poa Lab, Themeda* |
| 24/11/2015 | 1 | 12:00 | 50 | 0 | 27.1 | 0 | W | 30 | dry | 50 | Poa labillardierei, Rytidosperma spp., Themeda triandra, bare ground 20% |
| 9/12/2015 | 1 | 15:22 | 4 | 0 | | | | | | | |
| 31/12/2013 | 1 | 11:45 | 4 | 0 | 20 | 20 | NW | | dry | | Rytidosperma spp. |
| 3/01/2013 | 2 | 11:12 | 3 | 0 | 32 | 2 | SE | 6 | Dry | 32 | *Nassella neesiana, Rytidosperma* spp., *Vulpia*, *Anthoxanthum odoratum* |
| 10/01/2013 | 5 | 11:50 | 1 | 0 | 23 | 1 | NE | 3 | Dry | 36 | *Nassella neesiana, Rytidosperma* spp., *Themeda triandra* |
| 31/12/2012 | 3 | 13:00 | 10 | 0 | 23.5 | 5 | SE | 7 | Dry | 46 | *Rytidosperma* spp., *Nassella neesiana, Poa labillardieri* |
| 11/12/2012 | 3 | 13:15 | 21 | 0 | 28 | 10 | SE | 11 | Dry | 41 | *Nassella neesiana, Rytidosperma* spp., *Vulpia*, *Anthoxanthum odoratum* |
| 12/12/2012 | 5 | 15:00 | 1 | 0 | 32 | 5 | NE | 15 | Dry | 24 | Nassella neesiana, Rytidosperma spp. <5% bare ground. |
| 18/12/2012 | 3:25 | 11:45 | 85 | 0 | 23.4 | 20 | SSW | 7 | Dry | 34 | *Nassella neesiana, Rytidosperma* spp., *Vulpia*, *Anthoxanthum odoratum* |

**Figure 3a. Golden Sun Moth Habitat, Woodland Reserve, 225-285 Donnybrook Rd, Mickleham**




**Legend**

- Woodland Reserve (Fenced)
- Newland Ruin
- Rocky Area
- Good GSM Habitat (36.6ha)
- Poor GSM Habitat (7.8ha)
- Transmission Line
- Contour (1m)
- Property Boundary

GDA 1994 MGA Zone 55

Note: location of property boundaries, watercourse and topography indicative only

Scale 1:5,500 (A4)

Date Created: 31st July 2014

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Ph 03 9431 5444
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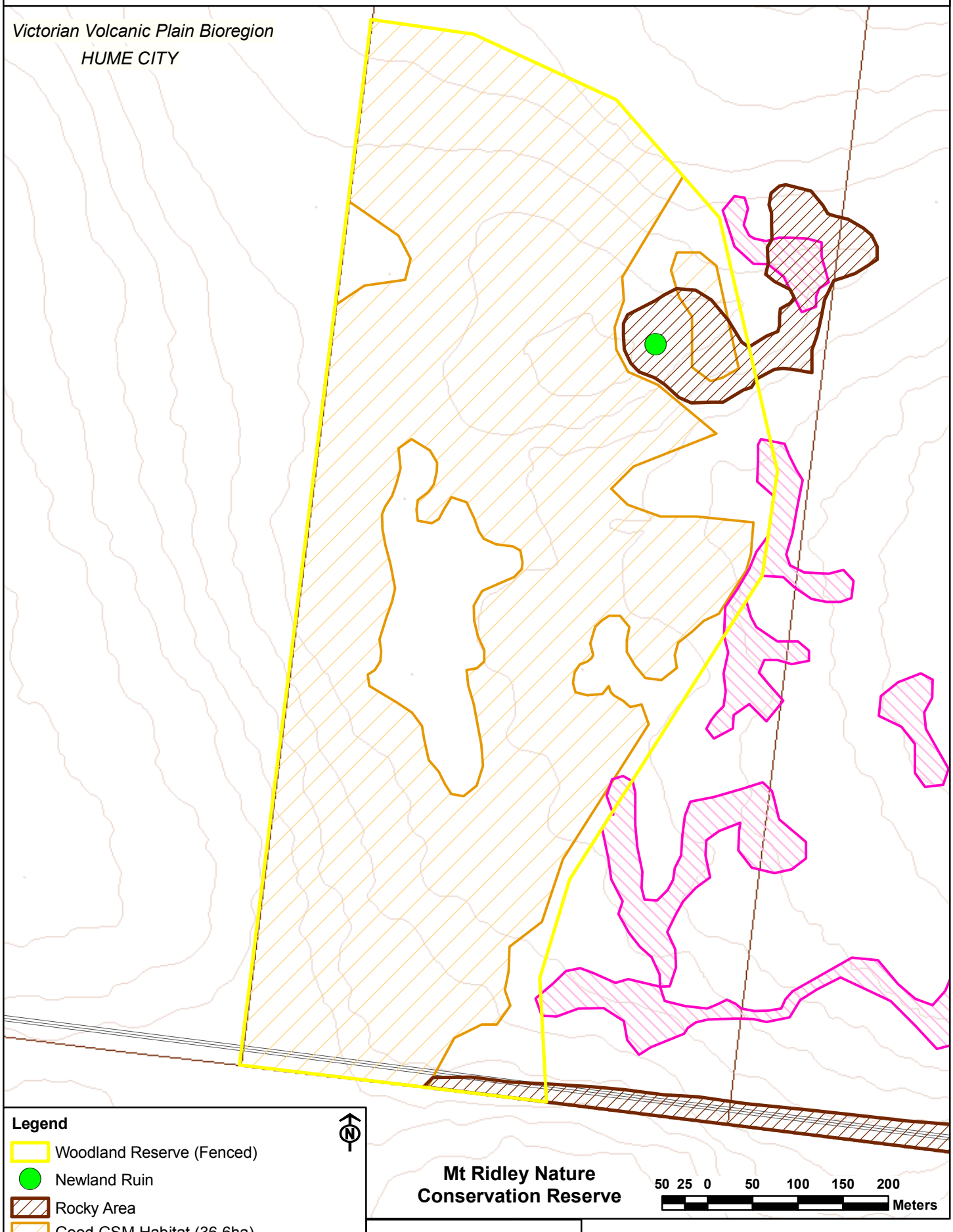
**Figure 3b. Golden Sun Moth Habitat, Woodland Reserve, 225-285 Donnybrook Rd, Mickleham**

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# 6 Management Actions

## 6.1 Fuel Breaks

Fuel breaks will be required to be established and maintained year-round along all site boundaries except the southern common boundary with Mount Ridley Nature Conservation Reserve.

Works to establish the fuel breaks (and all works in general) must avoid the Newland Ruin and surrounds (approximate 10m buffer, see Figures 3a and 3b).

## 6.2 Baseline Ecological Assessment and Ongoing Monitoring Program

A benchmark assessment of vegetation condition and the status of the Golden Sun Moth (GSM) population within the GSM habitat area (see Figures 3a and 3b) will be undertaken to inform the management plan and is to be documented as part of the annual works record for the first year of management. Ongoing assessments will be undertaken at regular frequencies and following key events that pose a risk to the species and/or habitat. They will be conducted by appointed ecologists adhering to established survey guidelines and protocol[2].

Baseline and on-going monitoring will involve vegetation and habitat assessments at each photo monitoring point, as well as a targeted Golden Sun Moth survey as outlined below:

*Vegetation and Habitat Assessment parameters:*

- Surveys are to be conducted in spring and will include a general description of the condition of the site and flora species list (any threatened species or notable weed infestations are to be mapped for follow-up monitoring or control, respectively).
- Vegetation and habitat assessments should be conducted using a 1m x 1m quadrat at each of the established monitoring points.
- A photo of the vegetation condition and structure is to be taken at each monitoring point.
- The following information is to be collected within each quadrat:
    - Current vegetation condition
    - Weed species (and % cover)
    - Host plant species (and % cover)
    - Bare ground
    - Sward height
- Vegetation and habitat assessments are to be documented and provided to the regulatory authority as part of the annual management report.

*Targeted Golden Sun Moth Survey*

A Targeted Golden Sun Moth survey is to be undertaken during each annual flying period (late October – January) and will adhere to DSEWPaC (2009) survey guidelines. The following summarises survey guidelines for the site;

- Surveys to be conducted by suitably qualified and experienced ecologists or landowner.

[2] http://www.environment.gov.au/system/files/resources/b945f32e-3f75-4739-a793-9f672893f3bb/files/golden-sun-moth.pdf

- Surveys conducted across the entire offset site, irrespective of whether the vegetation is native or exotic and irrespective of past or current land management practices.
- Surveys commence when the flight season around the Melbourne region begins (contact DELWP for more information).
- Surveys to be conducted over four non-consecutive suitable days (or until moths are detected)
- Moths are most likely to be active under the following conditions:
    - Warm to hot day (generally above 20°C by 10am),
    - Clear or mostly cloudless sky,
    - Still or relatively still wind conditions,
    - At least two days since rain,
- Once moths are detected, survey effort should be concentrated around determining the size and distribution of the population.
- Given the size of the survey area, a transect approach (50m between each transect) with two or more observers will be most practical and efficient.
- Temperature, wind speed and humidity data for the offset site is to be recorded either on-site using a hand-held weather meter (e.g. Kestrel® model k3500) measured at ~50 cm off the ground, or using observations from the nearest weather station from the Bureau of Meteorology website (Bureau of Meteorology, www.bom.gov.au).
- Targeted survey results are to be documented and provided to the regulatory authority as part of the annual management report.

## 6.3 Site Assessment and Reporting

The conditional approval (see Appendix 1) requires the approval holder to post a report on their website annually  for each year of the ten years of this management plan and thereafter at the reasonable request of the Secretary. Reports are to be posted on their website within 3 months of every 12 month anniversary date from commencement of construction.

The Annual Report must address the progress against the commitments as described in Section 3.1. The report should provide enough detail in the form of written comments and supporting evidence that an assessor can easily determine the completion of or progress against the management commitments .

Assessment of the reserve is to be undertaken at the completion of each year by the land manager and/or the works contractor. This assessment of weed issues, biomass condition, pest animal activity, fencing and Eucalypt regeneration will provide information for the annual report as required under the conditional approval (see Appendix 1). The report will assist in determining works resources and timing over the coming year. Annual assessments provide the ability to reflect on the results of the previous years' works, enabling adaptation of management activities where required in response to changes in environmental conditions.

Results of the site assessment will be recorded in an annual management report, together with vegetation and habitat assessment results as outlined previously in Section 5.2. At years 3 and 5, a detailed report of site condition and results of management activities (both successes and failures).Reporting will be compiled by Parks Victoria and provided to the approval holder, unless otherwise agreed with the approval holder, and must be posted on the approval holders website.

This Reserve Management Plan should be reviewed in its entirety at year 5 to best ensure the most effective and appropriate management is being undertaken in response to site change (a result of the first 5 years works and also environmental conditions throughout this period) and to revise the management outlook for the final 5 years. This review should be undertaken by a suitably qualified ecological consultant and submitted to the above stakeholders for approval.

At the completion of the offset management period (year 10), a final report is to be compiled by an ecological consultant and will include a full Golden Sun Moth survey and vegetation and habitat assessment to determine if the works undertaken were successful in the overall objective of maintaining or enhancing Golden Sun Moth population size and distribution within the reserve. This final report is to be submitted to the approval holder.

## 6.4 Fencing

The property is currently fenced as part of on-going kangaroo management initiatives in the reserve. Standard, farm-style 'post and wire' fencing along the north, east and western reserve boundaries have been upgraded to 1.5m black chain mesh fencing with one top-rail. Fence along the southern boundary will not be upgraded as it abuts the Mount Ridley Nature Conservation Reserve. The new fence acts as a visual deterrent to kangaroos, but still allows them to transcend the fence safely. It serves to delineate and buffer the reserve from the adjoining future public recreation reserve in the west and development in the east, restricting unauthorised access by pedestrians and vehicles.

The existing fence meets the Parks Victoria standard. All fencing around the perimeter of the site is to be monitored regularly for any inefficiency in restricting access to the reserve and any repairs undertaken accordingly (Table 4).

Fencing was upgraded in the first year of works as part of broader kangaroo management initiatives for the reserve as outlined in Section 6.8.

**Table 4. Fencing method and timing.**

| **Site**(s) | **Method** | **Location for fencing and length** | **Timing** |
|---|---|---|---|
| All Sites | Maintain fencing around boundary of all sites in good condition according to the standards detailed in information sheet 12[3] Standards for Management – Fencing. | Entire boundary around all sites where fencing exists. | Ongoing |

## 6.5 Weed Control

### *Management Issues*

Since the commencement of this plan in 2014 management of weeds has been undertaking through the use of herbicide application. Extensive patches of Artichoke Thistle **Cynara cardunculus* and scattered plants of Serrated Tussock **Nassella trichotoma* and African Boxthorn **Lycium ferocissimum* are present. All three species are listed as 'Controlled' under the *Catchment and Land Protection* (CaLP) *Act 1994* and require immediate control to prevent further spread. One additional species, Chilean Needle-grass **Nassella neesiana*, is listed as restricted under the CaLP Act and currently poses a significant threat to

[3] *DEPI 2013, BushBroker information sheet 12 – Standards from management – fencing. Department of Environment and Primary Industries, East Melbourne.*

the integrity of the site, occurring in extensive patches across the north and southern areas. Timely management of this species is also required in order to prevent further spread into higher quality vegetation within the reserve.

An effective approach for long-term weed management is likely to include a combination of prescribed burning, slashing/mowing/brush-cutting and herbicide application. The following is a guide to an integrated management approach:

- Herbicide application through spot-spraying and/or 'wick wiping' should be undertaken as necessary to manage notable patches of grassy weeds amongst indigenous dominated areas and to control the major invasion fronts.
    - This will apply particularly to patchy infestations of high threat weeds such as *Nassella* spp. and should continue for three years. Monitoring of indigenous spp. recruitment in the control areas should be part of the annual monitoring and reporting program.
    - In areas where indigenous spp. are not replacing the high threat weeds, planting or direct sowing with competitive indigenous grass species such as *Themeda triandra* should be a consideration.
    - The invading edge of *Nassella* should be mapped as part of the year 1 baseline vegetation assessment and monitored closely for the duration of the management period.
    - Spraying and slashing along the invasion line to halt the spread will be required.
- Herbicide application amongst remnants may be best approached by a two pass herbicide application method. This process involves a first pass using only a grass specific herbicide and in the second only a broadleaf specific herbicide. This method is a very effective means for killing most target species with very low levels of off target damage.
- Burning of exotic dominated areas, prior to undertaking a targeted weed control program, should be considered to assist control of weed spread and biomass accumulation in species such as **Nassella neesiana* and Toowoomba Canary-grass **Phalaris aquatica* (see 'Controlled Burning', section 4.6.1).
- Slashing/mowing/brush-cutting of flowering plants is to be undertaken as required. This is informed by regular scheduled monitoring. Operators will require very specific instruction. Mowing is to occur prior to seed set and as such may need to occur several times over a relatively short period.
    - Slashing in areas with significant cover of indigenous species will need to be timing to allow set seed. In these areas a small mower or brush-cutter may be required to remove *Nassella* flowers amongst indigenous plants. To best avoid this requirement, spot spraying of small **Nassella* patches in these areas is proposed.
- Slashing and herbicide application will be critical tools during any post-burn period. Large gaps will be created between grass tussocks that potentially will be colonised by a range of exotic species, many of which pose a high ecological threat.

### 6.5.1 Woody Weeds

Elimination of all woody weeds

All woody weeds on site must be eliminated. The objective is to aim to eliminate all woody weeds list in Table 5 by the end of the second year of management using the methods outlined in Table 5. Indigenous plants should not be impacted during treatment. Monitor for any re-sprouting or seedling and eradicate (either by using the spot spray or hand pull techniques).

Refer to BushBroker Information Sheet 8[4] - Standards for Management – Weeds.

New and emerging woody weeds

Monitoring for new and emerging woody weeds should be conducted throughout the year and any new and emerging woody weeds eliminated.

Refer to Information Sheet 8 - Standards for Management – Weeds

**Table 5: Woody weeds to be eliminated – method and timing.**

| Common name | Scientific name | Habitat zone(s) | Method | Timing |
|---|---|---|---|---|
| African Boxthorn | *Lycium ferocissimum* | HZ1 | Herbicide application directly onto foliage and after 'cut & paint ' | Completed in 1st year |
| | | All | Monitor and eliminate all new and emerging woody weeds | Ongoing |

### 6.5.2 Herbaceous Weeds

Control of all herbaceous weeds

To ensure management requirements are met, cover of herbaceous weeds is not allowed to increase beyond current levels. Weeds listed in Table 6 were found on site and are considered to be a high threat, including a number of introduced grasses. These weeds should be monitored each year to ensure their cover is not increasing, and controlled using the methods outlined. Treat weeds before the plant has flowered and set seed. Indigenous plants should not be impacted during treatment.

Refer to BushBroker Information Sheet 8 - Standards for Management – Weeds.

**Table 6: Herbaceous and other high-threat grassy weeds to be controlled – method and timing.**

| Common name | Scientific name | Habitat zone(s) | Method | Timing |
|---|---|---|---|---|
| Sheep Sorrel | *Acetosella vulgaris* | 1 & 2 | Herbicide application through spot-spraying &/or 'wick wiping' | Winter or spring |
| Cape Weed | *Arctotheca calendula* | 1 | Broadleaf herbicide application through spot-spraying &/or 'wick wiping' | Winter or spring |
| Large Quaking-grass | *Briza maxima* | 2 | Herbicide application through spot-spraying &/or 'wick wiping' | Winter to spring |

[4] *DEPI 2013, BushBroker information sheet 8 – Standards from management – Weeds. Department of Environment and Primary Industries, East Melbourne.*

| Common name | Scientific name | Habitat zone(s) | Method | Timing |
|---|---|---|---|---|
| Soft Brome | *Bromus hordeaceus subsp. hordeaceus* | 2 | Herbicide application through spot-spraying &/or 'wick wiping' | Spring |
| Artichoke Thistle | *Cynara cardunculus* | HZ1 & 2 | Herbicide application directly onto foliage and after 'cut & paint ' | Completed in 1st year |
| Flatweed | *Hypochaeris radicata* | 1 & 2 | Broadleaf herbicide application through spot-spraying &/or 'wick wiping' | All year |
| Hairy Hawkbit | *Leontodon taraxacoides subsp. taraxacoides* | 2 | Broadleaf herbicide application through spot-spraying &/or 'wick wiping' | Spring |
| Perennial Rye-grass | *Lolium perenne* | 2 | Herbicide application through spot-spraying &/or 'wick wiping' | Spring |
| Horehound | *Marrubium vulgare* | 1 | Herbicide application through spot-spraying &/or 'wick wiping' | All year |
| Serrated Tussock | *Nassella trichotoma* | 1 | Herbicide application through spot-spraying &/or 'wick wiping' | Spring, although need to be mindful of timing impacts for GSM larvae and seed set |
| Chilean Needle-grass | *Nassella neesiana* | 1 & 2 | Herbicide application through spot-spraying &/or 'wick wiping' | All year, although need to be mindful of timing impacts for GSM larvae and seed set |
| Toowoomba Canary-grass | *Phalaris aquatica* | 1 & 2 | Herbicide application through spot-spraying &/or 'wick wiping' | Spring |
| Buck's-horn Plantain | *Plantago coronopus* | 1 | Broadleaf herbicide application through spot-spraying &/or 'wick wiping' | All year |
| Ribwort | *Plantago lanceolata* | 1 & 2 | Broadleaf herbicide application through spot-spraying &/or 'wick wiping' | All year |
| Onion Grass | *Romulea rosea* | 1 & 2 | Herbicide application through spot-spraying &/or 'wick wiping' | Winter |
| Fiddle Dock | *Rumex pulcher subsp. pulcher* | 1 | Braodleaf herbicide application through spot-spraying &/or 'wick wiping' | Winter |
| Rough Sow-thistle | *Sonchus asper* | 1 | Broadleaf herbicide application through spot-spraying &/or 'wick wiping' | Spring |
| Common Sow-thistle | *Sonchus oleraceus* | 2 | Broadleaf herbicide application through spot-spraying &/or 'wick wiping' | Spring |
| Subterranean Clover | *Trifolium subterraneum* | 1 | Herbicide application through spot-spraying &/or 'wick wiping' | Winter |

The total cover for all grassy/herbaceous weeds, at the time of assessment, are shown in Table 7. Weed cover levels must not exceed these amounts.

**Table 7: Total cover of grassy/herbaceous weeds in the Habitat Zone – method and timing.**

| **Habitat zone**(s) | **Total cover of all grassy/herbaceous weeds (%)** |
|---|---|
| HZ 1 | 45% |
| HZ 2 | 35% |

New and emerging herbaceous weeds

Monitoring for new and emerging herbaceous weeds should be conducted throughout the year and any new and emerging high threat weeds eliminated.

Refer to BushBroker Information Sheet 8 - Standards for Management – Weeds.

## 6.6 Biomass Management for Golden Sun Moth

Biomass management for Golden Sun Moth habitat can be achieved by grazing, slashing/mowing and/or controlled burns. Management of the offset site in recent years has resulted in optimal habitat for the species, as evidenced by the population numbers and distribution recorded in recent site surveys[5]. However, the recent drought-break coupled with the removal of livestock grazing has resulted in a significant cover of exotic grasses which will be the focus of biomass management efforts in the conservation management period. In addition, as grazing is not considered for reintroduction within the reserve, infrequent controlled ecological burning will become an imperative tool for biomass management.

Where a weed control program is proposed and undertaken as part of the management regime, ecological burning can serve to assist with control of exotic flora (see section 4.5). Burning stimulates germination from seeds of both indigenous and exotic flora and as such will assist in exhausting the stored seed bank of exotics. However, as germination is promoted, any ecological burning will need to be diligently followed-up with a targeted weed control program.

### 6.6.1 Controlled burning

Fire plays a key role in influencing the structure, composition and ecological processes within treeless Grasslands and Grassy Woodlands. If undertaken appropriately, the use of fire as a management tool can be highly effective for maintaining grass tussock health, forb diversity and for management of some environmental weeds (Lunt & Morgon 1999). The potential benefit of any scheduled burn program will largely depend on the scale, season, frequency and intensity of burning, and would need to consider past management history, weeds and floristic communities present on the site.

Fire intensity

Fire episodes within grasslands are predominately of low intensity, regardless of time since fire. Kangaroo grass dominated areas in the reserve have lower tree cover and are likely to burn at low intensity regardless of climatic and seasonal conditions. The more heavily wooded areas in the centre of the site should be managed differently due to the presence of woody litter, logs, dead trees and the

[5] Abzeco (2013) '*Targeted Golden Sun Moth Synemon plana survey for land at 225 and 285 Donnybrook Road, Mickleham, Victoria.* Abzeco Pty Ltd, Eltham, Victoria.

high cover of *Poa labillardierei*. Any management burning undertaken within the woodland area must avoid consuming logs as these are critical habitat for fauna species. To prevent the consumption of logs and to protect remnant trees the woodland area should be burnt at low-moderate intensity. In addition, slashing around logs and the base of trees should be undertaken prior to any management burn.

In general *Poa* dominated Woodland communities are burnt at lower intensity and require burning less often than *Themeda* dominated communities. This floristic community may recover more slowly and as such accumulate organic matter slower than *Themeda* areas.

Frequency of fire events

Establishing a suitable fire frequency within the management area will largely depend on the vegetation structure (including the dominant understorey species) and desired outcome (e.g. weed control, fuel reduction, forb recruitment, biomass management). Within the management area, it is likely that burning at high frequencies (<5 years) in *Themeda* areas would favour the growth of indigenous herbs and grasses but would prevent the establishment of shrubs and recruitment of new trees. Burning at lower frequencies (>10 years) in these areas may allow the establishment of shrubs but lead to closure within the grassland. Taking this into consideration, areas with low canopy cover and *Themeda* dominated understorey may be better treated as a Grassland, whereas *Poa* dominated Grassy Woodland would benefit from a lower fire frequency. Areas of Grassy Woodland lacking dense *Themeda* cover are most suitable for establishing shrubs and as such would require fire intervals sufficient to ensure seed set, particularly by fire sensitive species, between burns.

Scheduled burning for environmental weed control

If used appropriately, fire can be an effective management tool for assisting control of environmental weeds. The importance of post burn follow-up management cannot be overemphasised. If the desired outcome is principally to control weeds then the burning zone should only be as large as can be adequately managed during follow-up works.

The specific actions for management burn operations are detailed below.

Avoiding impacts on logs

A high density of logs occurs throughout the management area. These logs are considered to be high quality habitat for native fauna as they increase the structural complexity of the site, providing suitable nesting and cover for a diversity of species. Any prescribed burning within the management area should avoid impacting logs. This can be achieved by suitable burn preparation (wetting down logs, clearing surrounding grass, raking fuel, burning around them first etc.).

Implementation

- Any scheduled burn is preceded by systematic flora and fauna survey, targeted weed control and fuel management around key assets such as logs and dead trees.
- The frequency of fire events will vary across the site. This frequency may differ in specific sections where the aim is to control environmental weeds.
- Post fire monitoring of flora and fauna recovery is undertaken at regular intervals to inform the ongoing management program.

### 6.6.2 Slashing

Slashing of understorey vegetation may be used in specific areas for managing biomass and reducing seed-set in areas dominated by exotic grasses. This method is generally only considered appropriate in

areas where burning is not achievable or specifically for managing high threat grasses. Management of high threat grasses such as *Nassella* can be assisted through mowing at flowering time, prior to seed set, as flower stems are unpalatable to stock. Slashing, mowing and brush-cutting can be effective methods, but leftover thatch can smother plants, particularly smaller inter-tussock forbs. A catcher-mower can be used at times when green fodder is highest to collect thatch as it is cut. This can be impractical over large areas due to the need to empty the catcher often.

The specific details for slashing operations are provided in the following section.

Implementation

- Slashing should only be used as a last resort in areas of good quality vegetation, if no other appropriate management option is practicable. Slashing of higher quality areas should only be used after seed of indigenous flora is set and dropped. The cut thatch should be caught and removed to prevent smothering. Timing of slashing in any year may vary but generally would not occur until mid to late January.
- If undertaken for weed management, slashing should occur during peak flowering of the target species and should also include the catching and removal of cut thatch if indigenous flora species are present.
- Extreme caution must be taken during slashing to ensure new weeds are not introduced on machinery and weed seed is not moved between areas on site, particularly into higher quality areas. This is particularly important for high threat grasses such as *Nassella* spp. Always slash in the highest quality areas first, then move into progressively more weedy areas. Induction, training and ongoing monitoring of slasher operators is required.
- Machinery hygiene procedures such as wash down prior to any vehicle entering or leaving the reserve is required. This may also be necessary for machines moving between management areas within the reserve.

## 6.7 Eucalypt Thinning

As a direct result of removal of livestock grazing, the site now supports an abundance and disproportionately large number of Eucalypt seedlings that will, if left untreated, cause a significant management issue. Thinning of Eucalypt seedlings as part of the integrated weed control or biomass management program will be a requirement every 1-2 years or when deemed appropriate. The majority of seedling should be expunged as part of a controlled burn or otherwise brush-cut, leaving a small amount untreated to grow to mature trees. Control of dense eucalypt regeneration on the site was undertaken in early summer of 2015 by trailer mounted weed wiper.

## 6.8 Kangaroo Population Monitoring and Management

Development of the surrounding area and increase in road traffic has had a significant impact on the local Kangaroo populations. Reduction in available grazing land has led to increased grazing pressure in fragmented areas of reserved native vegetation, including the present reserve. The presence of two farm dams within the reserve renders it particularly appealing to the local Kangaroo population and visitation to the reserve will increase during periods of drought.

There is significant potential for overgrazing by kangaroos to cause ecological damage in the Woodlands reserve. This may be mitigated to some extent by the management of this area as a

component of the larger Mickleham Woodlands for management burning. Kangaroos are generally attracted to recently burnt areas as they provide greener pick and may have higher nutritional value. The mosaic of burnt and un-burnt areas across the Mickleham Woodlands should assist in moving grazing pressure around the area. This is only effective however when the scale of a burn is sufficient to prevent overgrazing of the burn site. Smaller burnt areas in proportion to kangaroo populations can result in poor biodiversity outcomes as species are selectively grazed and either killed or prevented from flowering and setting seed. The options available for management of kangaroos beyond mosaic burning are limited to fencing, removing water sources and culling. Culling techniques are generally viewed as unfavorable.

Fencing

The existing boundary fence will be upgraded in the first year of works as part of on-going Kangaroo management initiatives in the reserve. Standard farm fencing along the north, east and western reserve boundaries will be upgraded to 1.5m black chain mesh fencing with one top-rail. Fence along the southern boundary will not be upgraded as it abuts the Mount Ridley Nature Conservation Reserve.

This new fencing will act as a visual deterrent to Kangaroos but will allow them to transcend the fence safely. It will also serve to delineate and buffer the reserve from the adjoining future public recreation reserve in the west and commercial development in the east, restricting access to persons and vehicles.

Filling Dams

The two farm dams in the reserve (see Figures 2a and 2b) will be filled in year 1 or year 2 of the works schedule as part of on-going Kangaroo population management. This will serve to remove available water within the site, making it less attractive to local Kangaroo populations. These areas will be rehabilitated after filling. They will be refilled and sown with indigenous grass seed. Grass seed may also be collected from the site for use in rehabilitation for follow-up sowing to ensure successful establishment and good cover of indigenous grass in disturbed areas.

It is expected that following grass seed sowing for stability and weed control, the farm dam areas will, in time, be naturally restored to the same quality and condition as vegetation in the immediate surrounds. These areas will remain part of overall management activities for the reserve and are not expected to require any additional resources for management than other areas within the site.

## 6.9 Pest Animals

The *Catchment and Land Protection Act 1994* lists rabbits, hares and foxes as established pest animals and requires that all landowners take reasonable steps to prevent the spread of, and as far as possible eradicate, established pest animals on their land.

Although it is unlikely that rabbits will become established in the area given the soil type and locality, rabbit activity should be monitored throughout the year. If rabbit activity is detected on the site use an integrated approach in accordance with BushBroker Information Sheet 6 - Standards of Management - Rabbits, which would involve fumigation, hand collapsing of burrows and baiting (Table 8). Remove any carcasses to prevent poisoning of native predators.

Hares have been recorded on the site and regular management by shooting has been undertaken.

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

[6] *DEPI 2013, BushBroker information sheet 7 – Standards from management – rabbits. Department of Environment and Primary Industries, East Melbourne.*

of management, regular spotlighting and shooting activities have been conducted for the management of pest animals.

Remove rubbish. Disperse artificial piles of logs and rocks that may be used as harbour by pest animals. Do not remove or disturb indigenous plants, natural fallen logs or rocks from the site.

Continue to monitor and control rabbits, hares and foxes twice yearly and react proactively to any new and emerging pest animals.

**Table 8: Pest animals to be controlled – species, method and timing.**

| **Habitat zone**(s) | **Common name** | **Method** | **Timing** |
|---|---|---|---|
| All | Rabbits & Foxes | Fumigation and hand collapse burrows and dens | Ongoing |
| All | Rabbits & foxes | Baiting | As require/if threat arises. |
| All | Rabbits | When baiting, collect and dispose of carcasses to prevent poisoning of native predators. | As require/if threat arises. |
| All | Rabbits & Foxes | Remove or disperse surface harbour | Ongoing |
| All | Rabbits, hares & foxes | Monitor and control by visual assessment of damage and by spotlighting at least twice yearly. | Ongoing |
| All | New & Emerging pest animals | Monitor and control as required | Ongoing |

# 7 Works schedule

Management of the reserve commenced at the beginning of 2014, year one of this schedule. The remainder of the detailed works schedule, provided on the following pages, is intended to guide the continuation of works to be undertaken on-site for the remainder of the 10 year period, and advise on-going management required to satisfy Bush Broker requirements and to ensure Golden Sun Moth habitat protection and the overall ecological integrity of the site is maintained and enhanced.

Given that ecological conditions may change in ways that cannot always be anticipated, the works schedule below should be considered a guide only. Site management should be adaptive, and respond appropriately to changes in conditions.

It should be noted that this Reserve Management Plan is to reflect beyond the initial ten year works period outlined, subject to revision in year 5. The reserve is to remain in perpetuity and be managed in such a way as to maintain and enhance the outcomes achieved over time.

## 7.1 Summary of works, required resources and indicative costing

| | **Commitment required for each task in each year** | | | | | | | | | | Indicative Costing | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Task** | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Yr. 5 | Yr. 6 | Yr. 7 | Yr. 8 | Yr. 9 | Yr. 10 | Unit^ | Total Units | Rate per unit | Cost (ex. GST, ex. CPI) |
| Fuel Breaks – Establishment and Maintenance | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | Day | 40 | 440 | 22,000 |
| Site Assessment | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | Day | 20 | 960* | 19,200 |
| Fencing – New Kangaroo Fencing | **COMPLETED** | | | | | | | | | | | | | |
| Dam Filling and rehabilitation | To be completed by landowner prior to transfer to the State of Victoria | | | | | | | | | | | | | |
| Weed Control – Artichoke Thistle | 14 | 12 | 8 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | Day | 62 | 440 | 34,100 |
| Fencing – Inspection and Repairs | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | Day | 40 | 440 | 22,000 |
| Weed Control – Woody Weeds | 8 | 6 | 6 | 6 | 6 | 4 | 4 | 4 | 4 | 4 | Day | 52 | 440 | 28,600 |
| Weed Control – Grassy/herbaceous Weeds | 24 | 24 | 24 | 12 | 12 | 10 | 8 | 8 | 8 | 8 | Day | 138 | 440 | 75,900 |
| Targeted GSM Survey | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | Day | 80 | 720 | 57,600 |
| Slashing | 6 | 5 | 5 | | 5 | | 5 | | 5 | | Day | 31 | 440 | 17,050 |
| Prescribed Burn - mosaic | | 1 | | | 1 | | | | 1 | | Burn | 3 | 15,000 | 45,000 |
| Eucalypt Thinning | 1 | | 1 | | 1 | | 1 | | 1 | | Day | 5 | 1,200 | 6,000 |
| Reporting | 3 | 3 | 5 | 3 | 5 | 3 | 3 | 3 | 3 | 5 | Day | 36 | 960* | 34,560 |
| Annual Cost ($, ex. GST) | 51,080 | 43,167.30 | 42,670.30 | 32,193.15 | 52,029.60 | 31,435.25 | 30,308.30 | 31,078.85 | 50,449.40 | 35,058.35 | | | Total ($) | 323,120 |
| CPI (%) | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | | | | |
| Adjusted Annual Payment ($, ex. GST) | 52,840 | 36,709.2 | 36,782 | 28,056.6 | 47,779.2 | 27,577 | 26,738.8 | 27,418.6 | 46,698.4 | 31,216.6 | | | Total ($, inc. projected CPI) | $399,470.50 |

^ One day is based on 10 hours for 1 person @ $55/hour ex. GST

*Site Assessment, Monitoring and Reporting to be undertaken by Ecologist at a rate of $120/hour ex.GST

## 7.2 Works Schedule by Year, Action and Timing

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.0 | All | Fuel Breaks – Establishment and Maintenance | Establish fuel breaks around the site perimeter with the exception of the southern common boundary with Mt Ridley NCR. Fuel breaks are to be maintained year-round and for the duration of the 10 year management period | na | Year-round | Day | 4 | Land Manager/ Contractor | Fuel breaks maintained year-round | | |
| 1 | 1.1 | All | Site Assessment - Works | Inspect site to inform weed control and biomass management works | na | Start Year 1 | Day | 1 | Land Manager/ Contractor | | | |
| 1 | 1.2 | All | Weed Control – Artichoke Thistle | Spot Spray Artichoke Thistles across the site. Concentrate on infestations and scattered plants in more degraded areas of the site across the north and south. | Table 3 | As soon as practicable - August | Day | 14 | Land Manager/ Contractor | Significant reduction in Artichoke Thistles across the site | | |

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.3 | All | Fencing | Inspect reserve fencing and ensure stock access is restricted. Undertake any repairs as required<br>Upgrade fencing on north, west and east sides to discourage Kangaroos, adhere to specifications in Section 5.8 of this plan. | Table 1 | As soon as practicable | Day | | Land Manager/ Contractor | Fence to be effective at restricting stock access in the short term. New fence along north, east and west will be effective at deterring Kangaroos but allowing safe passage | | |
| 1 | 1.4 | HZ2 | Dam Fill | Fill in two farm dams within the reserve. Rehabilitate filled areas as part of on-going restoration works elsewhere within the reserve | na | As soon as practicable | Days | | Land Manager/ Contractor | Water sources within the reserve permanently expunged. | | |
| 1 | 1.5 | All | Weed Control – Woody Weeds | Cut and paint Boxthorn across site (generally restricted to base of trees). Consider leaving cut Boxthorn in place as habitat | Table 2 | As soon as practicable | Day | 8 | Land Manager/ Contractor | Eliminate Boxthorn across the site | | |

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.6 | All | Weed Control – Grassy/herbaceous Weeds | Spot-spray Chilean Needle-grass in pockets and along fringes of infestation in degraded areas to avoid further encroachment into high quality areas. Take care to avoid off-target indigenous vegetation | Table 3 | Winter/ Spring | Day | 24 | Land Manager/ Contractor | No increase in cover of Chilean Needle-grass (and other grassy weeds) and prevention of spread into higher quality areas. | | |
| 1 | 1.7 | All | Targeted Golden Sun Moth Survey and habitat assessment | Undertake targeted survey of Golden Sun Moth, adhering to published survey guidelines (DEWHA 2009). Establish photo points, Undertake vegetation and habitat quadrat assessment | na | November-January (each year) | Day | 8 | Ecological Consultant | No decrease in size and distribution of population Vegetation and habitat quality and extent to be monitored for duration of management period and used to inform reporting | | |

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.8 | All | Slashing | Slash in practical areas of the site to reduce grassy biomass at base of old trees and surrounding fallen logs to give protection in the event a prescribed burn is undertaken | na | Prior to prescribed burn | Day | 6 | Land Manager/ Contractor | Protect old trees and habitat logs by reducing grassy biomass prior to burning | | |
| 1 | 1.9 | All | Prescribed Burn - Mosaic | Prescribed burn to be undertaken in a mosaic fashion across site to reduce grassy biomass and thin Eucalypt saplings | na | Spring 2014 or Autumn 2015 | Burn | 1 | Land Manager/ Contractor | Overall reduction in grassy biomass and eucalypt saplings across entire site (95% burnt) | | |
| 1 | 1.10 | All | Pest Animal Control | Monitor and control foxes and rabbits | Table 5 | Year round | Day | 1 | Land Manager/ Contractor | Control numbers of foxes and rabbits | | |
| 1 | 1.11 | All | Eucalypt Sapling Thinning | Thinning will occur naturally if a burn is undertaken (see action 1.7)<br>In the absence of a burn, consider brush cutting or 'Ecoblade' (brush-cut and | na | Year round | Day | 4 | Land Manager/ Contractor | Thin 95% of saplings in the first year | | |

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.12 | All | Reporting | Undertake a review of Year 1 works. Report on standard achieved, any deviations from the works schedule and any changes to proposed works for the following year as a result. | na | End Year 1 works | Day | 3 | Land Manager/ Contractor | Report to the approval holder on works completed, standard achieved, any changes to upcoming works schedule. Include photo points and vegetation/ habitat assessment | | |
| 2 | 2.0 | All | Fuel Breaks – Maintenance | Maintain fuel breaks around the site perimeter with the exception of the southern common boundary with Mt Ridley NCR. management period | na | Year-round | Day | 4 | Land Manager/ Contractor | Fuel breaks maintained year-round | | |
| 2 | 2.1 | All | Weed Control – Artichoke Thistle | Spot Spray Artichoke Thistles across the site. Concentrate on infestations and scattered plants in more degraded areas of the site across the north and south.<br>Greater resources required if burn has been undertaken | Table 2 | June - August | Day | 12-16 | Land Manager/ Contractor | Significant reduction in Artichoke Thistles across the site | | |

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 2.2 | All | Fencing | Inspect reserve fencing and ensure stock access is restricted. Undertake any repairs as required | Table 1 | Once per year | Day | 4 | Land Manager/ Contractor | Fence to be effective at restricting stock access. | | |
| 2 | 2.3 | All | Weed Control – Woody Weeds | Cut and Paint or spot spray Boxthorn across site. Consider leaving cut Boxthorn in place as habitat.<br>Monitor site for any emerging woody weed issues and implement management accordingly | Table 2 | Year round | Day | 6 | Land Manager/ Contractor | Eliminate woody weeds across the site and ensure no new infestations arise | | |
| 2 | 2.4 | All | Weed Control – Grassy/herbaceous Weeds | Spot-spray Chilean Needle-grass in pockets and along fringes of infestation in degraded areas to avoid further encroachment into high quality areas. Take care to avoid off-target indigenous vegetation.<br>Monitor site for any emerging grass/herbaceous weed issues and implement management accordingly | Table 3 | Winter/Spring | Day | 24 | Land Manager/ Contractor | No increase in cover of Chilean Needle-grass (and other grassy weeds) and prevention of spread into higher quality areas. | | |

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 2.5 | All | Targeted Golden Sun Moth Survey and habitat assessment | Undertake targeted survey of Golden Sun Moth, adhering to published survey guidelines (DEWHA 2009). Undertake vegetation and habitat quadrat assessment and photo points | na | November-January (each year) | Day | 8 | Ecological Consultant | No decrease in size and distribution of population Vegetation and habitat quality and extent to be monitored for duration of management period and used to inform reporting | | |
| 2 | 2.6 | All | Slashing (if site not burnt in year 1) | Slash in practical areas of the site to reduce grassy biomass at base of old trees and surrounding fallen logs to give protection in the event a prescribed burn is undertaken | na | Prior to prescribed burn | Day | 5 | Land Manager/ Contractor | Protect old trees and habitat logs by reducing grassy biomass prior to burning | | |

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 2.7 | All | Prescribed Burn - Mosaic (if not already undertaken in year one or continuation of) | Prescribed burn to be undertaken in a mosaic fashion across site to reduce grassy biomass and thin Eucalypt saplings | na | Spring or Autumn | Burn | 1 | Land Manager/ Contractor | Overall reduction in grassy biomass and eucalypt saplings across entire site (95% burnt) | | |
| 2 | 2.8 | All | Pest Animal Control | Monitor and control foxes and rabbits | Table 5 | Year round | Day | 1 | Land Manager/ Contractor | Control numbers of foxes and rabbits | | |
| 2 | 2.9 | All | Reporting | Undertake a review of Year 2 works. Report on standard achieved, any deviations from the works schedule and any changes to proposed works for the following year as a result. | na | End Year 2 works | Day | 3 | Land Manager/ Contractor | Report to the approval holder on works completed, standard achieved, any changes to works schedule. | | |
| 3 | 3.0 | All | Fuel Breaks – Maintenance | Maintain fuel breaks around the site perimeter with the exception of the southern common boundary with Mt Ridley NCR. management period | na | Year-round | Day | 4 | Land Manager/ Contractor | Fuel breaks maintained year-round | | |

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 3.1 | All | Weed Control – Artichoke Thistle | Spot Spray Artichoke Thistles across the site. Concentrate on infestations and scattered plants in more degraded areas of the site across the north and south.<br>Greater resources required if burn has been undertaken | Table 2 | June - August | Day | 8-10 | Land Manager/ Contractor | Significant reduction in Artichoke Thistles across the site | | |
| 3 | 3.2 | All | Fencing | Inspect reserve fencing and ensure stock access is restricted. Undertake any repairs as required | Table 1 | Once per year | Day | 4 | Land Manager/ Contractor | Fence to be effective at restricting stock access. | | |
| 3 | 3.3 | All | Weed Control – Woody Weeds | Cut and paint or spot spray Boxthorn across site. Consider leaving cut Boxthorn in place as habitat<br>Monitor site for any emerging woody weed issues and implement management program accordingly | Table 2 | Year round | Day | 6 | Land Manager/ Contractor | Eliminate woody weeds across the site | | |

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 3.4 | All | Weed Control – Grassy/herbaceous Weeds | Spot-spray Chilean Needle-grass in pockets and along fringes of infestation in degraded areas to avoid further encroachment into high quality areas. Take care to avoid off-target indigenous vegetation.<br>Monitor site for any emerging grass/herbaceous weed issues and implement management program accordingly | Table 3 | Winter/Spring | Day | 24 | Land Manager/ Contractor | No increase in cover of Chilean Needle-grass (and other grassy weeds) and prevention of spread into higher quality areas. | | |
| 3 | 3.5 | All | Eucalypt Sapling Thinning | Thinning will occur naturally if a burn is undertaken in year 1 or 2<br>In the absence of a burn, consider brush cutting or 'Ecoblade' (brush-cut and | na | Year round | Day | 4 | Land Manager/ Contractor | In the absence of a burn or thinning in year 1/2, thin 95% of saplings. | | |

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 3.6 | All | Targeted Golden Sun Moth Survey and habitat assessment | Undertake targeted survey of Golden Sun Moth, adhering to published survey guidelines (DEWHA 2009). Undertake vegetation and habitat quadrat assessment and photo points | na | November-January (each year) | Day | 8 | Ecological Consultant | No decrease in size and distribution of population Vegetation and habitat quality and extent to be monitored for duration of management period and used to inform reporting | | |
| 3 | 3.7 | All | Pest Animal Control | Monitor and control foxes and rabbits | Table 5 | Year round | Day | 1 | Land Manager/ Contractor | Control numbers of foxes and rabbits | | |

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 3.8 | All | Reporting | Undertake a review of Year 3 works. Report on standard achieved, any deviations from the works schedule and any changes to proposed works for the following year as a result.<br>Assess Plains Swampy Woodland response to past 3 years management and inform ongoing works as a result | na | End Year 3 works | Day | 5 | Land Manager/ Contractor | Report on works completed, standard achieved, any changes to upcoming works schedule and GSM habitat assessment results<br>Submit report to the approval holder | | |
| 4 | 4.0 | All | Fuel Breaks – Maintenance | Maintain fuel breaks around the site perimeter with the exception of the southern common boundary with Mt Ridley NCR. management period | na | Year-round | Day | 4 | Land Manager/ Contractor | Fuel breaks maintained year-round | | |
| 4 | 4.1 | All | Weed Control – Artichoke Thistle | Spot Spray Artichoke Thistles across the site. Concentrate on infestations and scattered plants in more degraded areas of the site across the north and south. | Table 2 | June - August | Day | 4 | Land Manager/ Contractor | Significant reduction in Artichoke Thistles across the site | | |

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 4.2 | All | Fencing | Inspect reserve fencing and ensure stock access is restricted. Undertake any repairs as required | Table 1 | Once per year | Day | 4 | Land Manager/ Contractor | Fence to be effective at restricting stock access. | | |
| 4 | 4.3 | All | Weed Control – Woody Weeds | Cut and Paint or spot spray Boxthorn across site. Consider leaving cut Boxthorn in place as habitat<br>Monitor site for any emerging woody weed issues and implement management program accordingly | Table 2 | Year round | Day | 6 | Land Manager/ Contractor | Eliminate woody weeds across the site | | |
| 4 | 4.4 | All | Weed Control – Grassy/herbaceous Weeds | Spot-spray Chilean Needle-grass in pockets and along fringes of infestation in degraded areas to avoid further encroachment into high quality areas. Take care to avoid off-target indigenous vegetation.<br>Monitor site for any emerging grass/herbaceous weed issues and implement management program accordingly. | Table 3 | Winter/Spring | Day | 12 | Land Manager/ Contractor | No increase in cover of Chilean Needle-grass (and other grassy weeds) and prevention of spread into higher quality areas. | | |
| 4 | 4.5 | All | Eucalypt Sapling Thinning | No thinning year 4 | | | | | | | | |

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 4.6 | All | Targeted Golden Sun Moth Survey and habitat assessment | Undertake targeted survey of Golden Sun Moth, adhering to published survey guidelines (DEWHA 2009). Undertake vegetation and habitat quadrat assessment and photo points | na | November-January (each year) | Day | 8 | Ecological Consultant | No decrease in size and distribution of population Vegetation and habitat quality and extent to be monitored for duration of management period and used to inform reporting | | |
| 4 | 4.7 | All | Pest Animal Control | Monitor and control foxes and rabbits | Table 5 | Year round | Day | 1 | Land Manager/ Contractor | Control numbers of foxes and rabbits | | |
| 4 | 4.8 | All | Reporting | Undertake a review of Year 4 works. Report on standard achieved, any deviations from the works schedule and any changes to proposed works for the following year as a result. | na | End Year 4 works | Day | 3 | Land Manager/ Contractor | Report to the approval holder on works completed, standard achieved, any changes to works schedule. | | |

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 5.0 | All | Fuel Breaks – Maintenance | Maintain fuel breaks around the site perimeter with the exception of the southern common boundary with Mt Ridley NCR. management period | na | Year-round | Day | 4 | Land Manager/ Contractor | Fuel breaks maintained year-round | | |
| 5 | 5.1 | All | Weed Control – Artichoke Thistle | Spot Spray Artichoke Thistles across the site. Concentrate on infestations and scattered plants in more degraded areas of the site across the north and south. | Table 2 | June - August | Day | 4 | Land Manager/ Contractor | Eliminate Artichoke Thistles | | |
| 5 | 5.2 | All | Fencing | Inspect reserve fencing and ensure stock access is restricted. Undertake any repairs as required | Table 1 | Once per year | Day | 4 | Land Manager/ Contractor | Fence to be effective at restricting stock access. | | |
| 5 | 5.3 | All | Weed Control – Woody Weeds | Cut and Paint or spot spray Boxthorn across site.<br>Monitor site for any emerging woody weed issues and implement management program accordingly | Table 2 | Year round | Day | 6 | Land Manager/ Contractor | Eliminate woody weeds across the site | | |

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 5.4 | All | Weed Control – Grassy/herbaceous Weeds | Spot-spray Chilean Needle-grass in pockets and along fringes of infestation in degraded areas to avoid further encroachment into high quality areas. Take care to avoid off-target indigenous vegetation.<br>Monitor site for any emerging woody weed issues and implement management program accordingly | Table 3 | Winter/Spring | Day | 12 | Land Manager/ Contractor | No increase in cover of Chilean Needle-grass (and other grassy weeds) and prevention of spread into higher quality areas. | | |
| 5 | 5.5 | All | Eucalypt Sapling Thinning | Brush cutting or 'Ecoblade' (brush-cut and paint) | na | Year round | Day | 4 | Land Manager/ Contractor | Thin 95% of saplings | | |
| 5 | 5.6 | All | Targeted Golden Sun Moth Survey and habitat assessment | Undertake targeted survey of Golden Sun Moth, adhering to published survey guidelines (DEWHA 2009). Undertake vegetation and habitat quadrat assessment and photo points | na | November-January (each year) | Day | 8 | Ecological Consultant | No decrease in size and distribution of population Vegetation and habitat quality and extent to be monitored for duration of management period and used to inform reporting | | |

| Year | Action | Habitat zones | Management action | Description of action | Ref. table for action | Timing | Unit | Total Units | Who will undertake this action? | Standard to be achieved | Completed (Yes/No) | Month/Year Completed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 5.7 | All | Pest Animal Control | Monitor and control foxes and rabbits | Table 5 | Year round | Day | 1 | Land Manager/ Contractor | Control numbers of foxes and rabbits | | |
| 5 | 5.8 | All | Reporting | Undertake a review of Year 5 works. Report on standard achieved, any deviations from the works schedule and any changes to proposed works for the following year as a result.<br>Report on GSM habitat quality and extent and any changes in the first 5 years of the management period<br>Review entire Reserve Management Plan for the remaining 5 year management period. | na | End Year 5 works | Day | 5 | Land Manager/ Ecological Consultant | Report on works completed, standard achieved, any changes to upcoming works schedule and GSM habitat assessment results<br>Submit report to the approval holder. | | |
| 6-9 | Years 6 through to 9 will broadly follow the actions and timing outlined in year 5, with the exception of 'reporting' which will follow year 4. However, the results of the Year 5 review of the Reserve Management Plan will determine how management of the reserve moves forward for the remaining 5 years (years 6-10) of the management period. | | | | | | | | | | | |
| 10 | Year 10 will broadly follow the timing and actions for years 6-9 but will require a final detailed Report on the 10 year management period to be submitted to the approval holder.Review of the Reserve Management Plan is required to inform ongoing management. | | | | | | | | | | | |

# Appendix 1 – Conditional Approval, EPBC Act referral 2013/6913

# Appendix 2 – Flora Species List

| Origin | Botanical name | Common name |
|---|---|---|
| | *Acaena echinata* | Sheep's Burr |
| * | *Acetosella vulgaris* | Sheep Sorrel |
| | *Amphibromus nervosus* | Common Swamp Wallaby-grass |
| | *Anthosachne scabra (glabrous form)* | Common Wheat-grass |
| * | *Anthoxanthum odoratum* | Sweet Vernal-grass |
| * | *Arctotheca calendula* | Cape Weed |
| | *Arthropodium strictum s.s.* | Chocolate Lily |
| | *Asperula conferta* | Common Woodruff |
| | *Austrostipa bigeniculata* | Kneed Spear-grass |
| | *Austrostipa spp.* | Spear Grass |
| * | *Briza maxima* | Large Quaking-grass |
| * | *Bromus hordeaceus subsp. hordeaceus* | Soft Brome |
| * | *Callitriche stagnalis* | Common Water-starwort |
| | *Calocephalus lacteus* | Milky Beauty-heads |
| | *Carex inversa* | Knob Sedge |
| * | *Conyza bonariensis* | Flaxleaf Fleabane |
| | *Crassula decumbens var. decumbens* | Spreading Crassula |
| * | *Cynara cardunculus* | Artichoke Thistle |
| * | *Cynosurus echinatus* | Rough Dog's-tail |
| | *Dianella amoena* | Matted Flax-lily |
| | *Dichondra repens* | Kidney-weed |
| | *Drosera peltata subsp. peltata* | Pale Sundew |
| | *Einadia nutans subsp. nutans* | Nodding Saltbush |
| | *Eleocharis acuta* | Common Spike-sedge |
| | *Eleocharis macbarronii* | Grey Spike-sedge |
| | *Eleocharis pusilla* | Small Spike-sedge |
| | *Epilobium hirtigerum* | Hairy Willow-herb |
| | *Eryngium ovinum* | Blue Devil |
| | *Eryngium vesiculosum* | Prickfoot |
| | *Eucalyptus camaldulensis* | River Red-gum |
| | *Eucalyptus ovata* | Swamp Gum |
| | *Euchiton collinus* | Creeping Cudweed |
| | *Euchiton involucratus* | Star Cudweed |
| | *Geranium retrorsum s.s.* | Grassland Crane's-bill |
| | *Geranium sp. 2* | Variable Crane's-bill |
| | *Haloragis heterophylla* | Varied Raspwort |
| * | *Hordeum hystrix* | Mediterranean Barley-grass |
| | *Hypericum gramineum* | Small St John's Wort |
| * | *Hypochaeris glabra* | Smooth Cat's-ear |
| * | *Hypochaeris radicata* | Flatweed |
| | *Juncus amabilis* | Hollow Rush |
| | *Juncus australis* | Austral Rush |
| | *Juncus holoschoenus* | Joint-leaf Rush |
| | *Juncus subsecundus* | Finger Rush |

| Origin | Botanical name | Common name |
|---|---|---|
| * | *Leontodon taraxacoides subsp. taraxacoides* | Hairy Hawkbit |
| * | *Lepidium africanum* | Common Peppercress |
| | *Leptorhynchos squamatus subsp. squamatus* | Scaly Buttons |
| | *Lobelia pratioides* | Poison Lobelia |
| * | *Lolium perenne* | Perennial Rye-grass |
| * | *Lycium ferocissimum* | African Box-thorn |
| | *Lythrum hyssopifolia* | Small Loosestrife |
| * | *Marrubium vulgare* | Horehound |
| | *Microlaena stipoides var. stipoides* | Weeping Grass |
| | *Myriophyllum crispatum* | Upright Water-milfoil |
| * | *Nassella neesiana* | Chilean Needle-grass |
| | *Neopaxia australasica* | White Purselane |
| | *Oxalis perennans* | Grassland Wood-sorrel |
| * | *Phalaris aquatica* | Toowoomba Canary-grass |
| | *Plantago aff. gaudichaudii (Lowland Swamps)* | Swamp Plantain |
| * | *Plantago coronopus* | Buck's-horn Plantain |
| * | *Plantago lanceolata* | Ribwort |
| | *Poa labillardierei var. (Volcanic Plains)* | Basalt Tussock-grass |
| | *Poa sieberiana var. hirtella* | Grey Tussock-grass |
| | *Pseudognaphalium luteoalbum* | Jersey Cudweed |
| * | *Ranunculus muricatus* | Sharp Buttercup |
| | *Ranunculus sessiliflorus var. sessiliflorus* | Annual Buttercup |
| * | *Romulea rosea* | Onion Grass |
| | *Rumex brownii* | Slender Dock |
| * | *Rumex crispus* | Curled Dock |
| * | *Rumex pulcher subsp. pulcher* | Fiddle Dock |
| | *Rytidosperma caespitosum* | Common Wallaby-grass |
| | *Rytidosperma duttonianum* | *Brown-back Wallaby-grass* |
| | *Rytidosperma erianthum* | Hill Wallaby-grass |
| | *Rytidosperma setaceum* | Bristly Wallaby-grass |
| | *Schoenus apogon* | Common Bog-sedge |
| | *Solenogyne gunnii* | Hairy Solenogyne |
| * | *Sonchus asper s.s.* | Rough Sow-thistle |
| * | *Sonchus oleraceus* | Common Sow-thistle |
| ? | *Stellaria angustifolia* | Swamp Starwort |
| * | *Stellaria media* | Chickweed |
| | *Themeda triandra* | Kangaroo Grass |
| * | *Trifolium subterraneum* | Subterranean Clover |
| | *Utricularia beaugleholei* | Purple Bladderwort |
| | *Veronica gracilis* | Slender Speedwell |

* = exotic, introduced species

# Attachment 1- Offset site report

Australian Government
Department of the Environment

**Approval**

**Commercial and Residential Land Development at Donnybrook Rd, Mickleham, Victoria (EPBC 2013/6913)**

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999*.

**Proposed action**

| | |
|---|---|
| **person to whom the approval is granted** | AMP Capital Investors Ltd |
| **proponent's ACN (if applicable)** | 001 777 591 |
| **proposed action** | To construct a road and staged industrial and residential development at 225 and 285 Donnybrook Road, Mickleham, Victoria [See EPBC Act referral 2013/6913]. |

**Approval decision**

| Controlling Provision | Decision |
|---|---|
| Listed threatened species and communities (sections 18 & 18A) | Approved with conditions |

**conditions of approval**

This approval is subject to the conditions specified below.

**expiry date of approval**

This approval has effect until 31 December 2024.

**Decision-maker**

| | |
|---|---|
| **name and position** | James Tregurtha<br>Assistant Secretary<br>South-Eastern Australia Environment Assessments Branch |
| **signature** | |
| **date of decision** | 29 October 2014 |

**Conditions attached to the approval**

1. To compensate for the loss of 54.55 hectares of **Golden Sun Moth habitat**, the **approval holder** must protect at least 33.45 hectares of **Golden Sun Moth habitat** on land identified as part of 285 Donnybrook Road, Mickleham, Victoria, shown at Appendix 1. The **approval holder** must place an in perpetuity **protection mechanism** on the **offset site** prior to the **commencement of construction**. The **approval holder** must demonstrate to the **Department** that the **offset site** is protected in perpetuity prior to the **commencement of construction**.

2. The **approval holder** must provide the **Department** with the **offset attributes** and a **shapefile** for the **offset site** prior to the **commencement of construction**.

3. At least three months prior to **commencement of construction**, the **approval holder** must prepare and submit to the **Minister** for approval, an **Offset Management Plan**. The **Offset Management Plan** must be approved by the **Minister** and then be implemented prior to the **commencement of construction**. At a minimum, the **Offset Management Plan** must include:

    a. base line data and other supporting evidence that documents the extent and condition of habitat for the **Golden Sun Moth** at the **offset site**;

    b. illustrations and maps that clearly define the location and boundaries of the **offset site**;

    c. detailed information, including proposed commitments and timelines regarding management arrangements that will be undertaken at the **offset site**, from the **commencement of construction** and then into the future, to ensure the ongoing rehabilitation and improvement of the **offset site**. This must be consistent with all recommended habitat management measures identified in the *Approved Conservation Advice for* Synemon plana *(golden sun moth)* and relevant EPBC Act policy statements and papers;

    d. information and commitments about monitoring and reporting on the improvements in habitat condition of the **offset site** and the ongoing use of the site by the **Golden Sun Moth**;

    e. information and commitments about the ongoing maintenance of the **offset site**, including weed and pest control and the maintenance of fencing;

    f. the **Offset Management Plan** must be revised within ten years of the **commencement of construction**.

4. Prior to the **commencement of construction**, the **approval holder** must ensure the **offset site** is securely fenced so as to prevent dumping and entry by vehicles, except for vehicles conducting activities in accordance with the approved **Offset Management Plan**.

*Administrative conditions*

5. Within ten days after the **commencement of construction**, the **approval holder** must advise the **Department** in writing of the actual date of **commencement of construction**.

6. The **approval holder** must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement all **management plans** required by this approval, and make them available upon request to the **Department**. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act**, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department's** website. The results of audits may also be publicised through the general media.

7. Within three months of every twelve month anniversary of the **commencement of construction**, the **approval holder** must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any **management plans** as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the **Department** at the same time as the compliance report is published. Potential or actual contraventions of the conditions of the approval must be reported to the Department in writing within 2 business days of the **approval holder** becoming aware of the actual or potential contravention. All contraventions must also be included in the compliance reports.

8. Upon the direction of the **Minister**, the **approval holder** must ensure that an independent audit of compliance with the conditions of approval is conducted and a report of this independent audit submitted to the **Minister**. The independent must be undertaken by a person approved for this purpose by the **Minister** prior to the commencement of the audit. The audit must be undertaken under criteria approved by the **Minister**. Audit criteria must be agreed to by the **Minister**. The audit report must address the approved audit criteria to the satisfaction of the **Minister**.

9. If the **approval holder** wishes to carry out any activity otherwise than in accordance with a **management plan** as specified in the conditions, the **approval holder** must submit to the **Department** for the **Minister's** written approval a revised version of that **management plan**. The **approval holder** must not commence any activity not in accordance with the approved **management plan** unless and until the **Minister** has approved the varied **management plan** in writing. If the **Minister** approves the revised **management plan**, that **management plan** must be implemented in place of the **management plan** originally approved.

   Note: The **Minister** will not approve a varied **management plan** unless the revised **management plan** would result in an equivalent or improved environmental outcome over time.

10. If the **Minister** believes that it is necessary or convenient for the better protection of threatened species or migratory species to do so, the **Minister** may request that the **approval holder** make specified revisions to the **management plan** specified in the conditions and submit the revised **management plan** for the **Minister's** written approval. The **approval holder** must comply with any such request. The revised approved **management plan** must be implemented. Unless the **Minister** has approved the revised **management plan**, then the person taking the action must continue to implement the **management plan** originally approved, as specified in the conditions.

11. If, at any time after five years from the date of this approval, the **approval holder** has not **substantially commenced** the action, then the **approval holder** must not **substantially commence** the action without the written agreement of the **Minister**.

12. Unless otherwise agreed to in writing by the **Minister**, the **approval holder** must publish all **management plans** referred to in these conditions of approval on the **approval holder's** website. Each **management plan** must be published on this website within one month of being approved.

**Definitions**

**Approval holder** is the person to whom the approval is granted.

**Commencement of construction** is the date that on-ground preparatory works are first undertaken for the action, including but not limited to clearing of vegetation, the erection of any onsite temporary structures and the use of heavy duty equipment for the purpose of breaking the ground for infrastructure or earthworks.

**Department** is the Australian Government Department administering the **EPBC Act**.

**EPBC Act** is the *Environment Protection and Biodiversity Conservation Act 1999*.

**Golden Sun Moth** is the native moth species *Synemon plana* listed under the **EPBC Act**.

**Golden Sun Moth habitat** means land that may be used by the **Golden Sun Moth** to forage, breed, shelter or disperse.

**Management plan/s** means the document described in this approval as the **Offset Management Plan**, and any subsequent approved management plans.

**Minister** means the Minister administering the **EPBC Act** and includes a delegate of the Minister.

**Offset attributes** is an '.xls' file capturing relevant attributes of the **offset site**, including the EPBC reference ID number, the physical address of the **offset site**, coordinates of the boundary points in decimal degrees, the EPBC protected matters that the offset compensates for, any additional EPBC protected matters that are benefiting from the offset, and the size of the offset in hectares.

**Offset Management Plan** is a document developed by a **suitably qualified ecologist** detailing the long-term management of any offsets for the **Golden Sun Moth** required by the conditions of this approval.

**Offset site** is part of land at 285 Donnybrook Road, Mickleham, Victoria (Lot 2 LP210243 Vol 9792 Fol 812), identified by green shading and labelled "PCRZ" at Appendix 1.

**Protection mechanism** means an in perpetuity covenant or agreement on title protecting the land for conservation purposes, or the transfer of the **offset site** to the ownership of the State of Victoria.

**Shapefile** is an ESRI Shapefile containing '.shp', '.shx' and '.dbf' files and other files capturing attributes including at least the EPBC reference ID number and EPBC protected matters present at the relevant site. Attributes should also be captured in '.xls' format.

**Substantially commenced** means that all necessary approvals have been granted, all **management plans** have been approved and construction contractors have been engaged and are on site.

**Suitably qualified ecologist** is a person who has professional qualifications, training and/or experience relevant to the nominated subject matter and can give authoritative advice using relevant protocols, standards, methods and literature.

A person nominated by the approval holder as a suitably qualified ecologist must have and be able to demonstrate at least:

- a tertiary education in a relevant area of study (such as natural resources, environmental sciences, zoology or botany) and five years of ecological field work experience, including at least one year of experience conducting surveys in Australia; or
- ten years of ecological field work experience in a relevant ecological field, including at least one year of experience conducting surveys in Australia.

## Appendix 1: Study area, extend of targeted GSM survey area & 'intact' vegetation at Donnybrook Rd, Mickleham