

Final Report

Targeted Golden Sun Moth *Synemon plana* Surveys, 510 Summerhill Road, Wollert, Victoria

Prepared for

Cleanaway Operations Pty Ltd

March 2023

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Ecology and Heritage Partners Pty Ltd

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EXECUTIVE SUMMARY

Introduction

Ecology and Heritage Partners Pty Ltd was engaged by Cleanaway Operations Pty Ltd (Cleanaway) to undertake targeted Golden Sun Moth *Synemon plana* surveys at 510 Summerhill Road, Wollert, Victoria (the 'proposal area'). The surveys were undertaken to determine the presence or absence of Golden Sun Moth and address any implications for the construction of the proposed waste-to-energy (WtE) facility known as the Melbourne Energy and Resource Centre (MERC) under Commonwealth and State environmental legislation.

Methods

Targeted surveys for Golden Sun Moth were undertaken during the known flight period of the species between December 2022 and January 2023 in accordance with the recommended survey guidelines detailed in the significant impact guidelines for the species (DEWHA 2009). Areas of suitable habitat were walked by qualified zoologists at a time which is considered suitable for detecting the species (i.e. between 10am and 3pm on warm (over 20°C by 10am) days with minimal cloud cover and still conditions).

Limitations

It is important to acknowledge that the number of documented records for the Golden Sun Moth within and around the proposal area is not necessarily a reflection of population size or density and does not offer information on how a species is making use of an area. It also must be noted that survey guidelines recommend four (4) surveys to be completed to determine presence/absence of a species, however only three (3) surveys were completed due to atypical wet and cold conditions impacting the Golden Sun Moth survey season.

Results

At the time of the assessment there were approximately 2433 documented Golden Sun Moth records in the Victorian Biodiversity Atlas (VBA) dated between 2012-2021 within a 10-kilometre radius of the proposal area (DELWP 2022a). No Golden Sun Moth were detected within the proposal area during the three surveys, though Golden Sun Moth were recorded at the reference site at all three occasions. The history of disturbance through farming of livestock at the site is likely to have resulted in degradation of existing Golden Sun Moth habitat, with the site supporting large open areas of non-native grasses and invasive weeds. The likelihood of Golden Sun Moth presence within the proposal area is considered low due to the absence of suitable habitat and history of disturbance of the site.

Legislative and Policy Implications

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

No Golden Sun Moth were recorded within the proposal area, with a population of species unlikely to be present within the proposal area due to a history of disturbance onsite. It is unlikely the proposed development will impact Golden Sun Moth species. Therefore, a referral to the Commonwealth Environment Minister under the EPBC Act is not required for the species.

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Flora and Fauna Guarantee Act 1988 (FFG Act - Victoria)

There were no Golden Sun Moth observed within the proposal area and no other threatened and/or protected species found under the FFG Act. Further, an FFG Act permit is not required for removal of species or communities on private land, or for the removal of habitat for a listed terrestrial fauna species.

Conclusion

Targeted surveys for Golden Sun Moth were undertaken on 19 December 2022, 12 and 27 January 2023. Surveys concentrated on areas identified as potential habitat, primarily those dominated by the exotic Chilean Needle-grass which is a known food sources for Golden Sun Moth.

Despite targeted surveys been undertaken during optimal survey conditions when the species was known to be flying at reference sites the species was not detected within the proposal area. As such, based on available information a resident population does not exist within the proposal area and the species will not be impacted by the proposed development of the proposal area.

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1 INTRODUCTION

1.1 Background

Ecology and Heritage Partners Pty Ltd was engaged by Cleanaway Operations Pty Ltd (Cleanaway) to undertake targeted Golden Sun Moth *Synemon plana* surveys at 510 Summerhill Road, Wollert, Victoria (the 'proposal area'). The proposal area has recently been purchased and a waste-to-energy (WtE) facility known as the Melbourne Energy and Resource Centre (MERC) is proposed to be developed on site.

The purpose of this assessment was to undertake targeted surveys for Golden Sun Moth to determine the presence or absence of this species, and where possible to ascertain its distribution and abundance and the extent of the species habitat within the proposal area. Three surveys were undertaken between December and January of 2023 under suitable conditions.

Although the study is located within the Melbourne Strategic Assessment (MSA) area, and any development is subject to approval conditions in accordance with the Biodiversity Conservation Strategy (BCS) (DEPI 2013a), targeted surveys were undertaken as part of a precautionary approach to gain a complete understanding of the biodiversity values on the site.

1.1.1 Biodiversity Conservation Strategy

The BCS and associated sub-regional species' strategies (DEPI 2013b) identify conservation outcomes and offset consolidation strategies for Victoria's native vegetation and Matters of National Environmental Significance (MNES) under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), including mechanisms for how these outcomes will be delivered. The BCS covers Melbourne's four growth corridors within the expanded 2010 Urban Growth Boundary, as well as 28 precincts under the 2005 Urban Growth Boundary, except where a planning scheme amendment to introduce a Precinct Structure Plan has been approved prior to 1 March 2012.

To facilitate the planning approvals process for Melbourne's growth areas, the Victorian Government has introduced the 'Time Stamping' project. This project captures, and 'time stamps' native vegetation information within Melbourne's urban growth areas. This data can then be used to calculate native vegetation offsets for future development, and to prepare Native Vegetation Precinct Plans (NVPP) for these areas.

Classes of actions associated with urban development in most of the land in Melbourne's growth corridors have been approved under Section 146B of the EPBC Act by the Commonwealth Environment Minister (Minister). The approval was made in relation to the western, north-western and northern growth corridors on 5 September 2013.

The proposal area is located within the northern growth corridor. The Commonwealth approvals are subject to conditions, which included the former Habitat Compensation Obligations (HCO) and the restriction of urban development in identified conservation areas.

1.2 Objectives

The objectives of the targeted surveys were to:

- Determine the presence/absence of Golden Sun Moth within the proposal area

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- Provide information in relation to any implications under Commonwealth and State environmental legislation and Government policy associated with the proposed development
- Determine any potential impacts on Golden Sun Moth, and its habitat at a National and State level associated with the proposed development
- If relevant, provide advice on mitigation measures that should be undertaken to avoid and/or mitigate potential adverse impacts on significant ecological values.

1.3 Proposal Area

The proposal area is located at 510 Summerhill Road, Wollert, and is approximately 26 kilometres north of Melbourne's CBD (Figure 1). The proposal area covers approximately 82 hectares in area and is bound by Summerhill Road to the south, and is surrounded by undeveloped pastureland to the north, east and west.

According to the Department of Environment, Land, Water and Planning (DELWP) Native Vegetation Information Management Tool (DELWP 2022b), the proposal area occurs within the Victorian Volcanic Plain bioregion, within the jurisdiction of the Yarra Valley Water Catchment Management Authority (CMA) and the City of Whittlesea municipality.

The proposal area falls within the Farming Zone (FZ), Rural Conservation Zone (RCZ) and includes Environmental Significance Overlay – Schedule 4 (ESO4). The proposal area is within the Northern Quarries Precinct Structure Plan (PSP) area within the MSA area and is subject to the assessment process and Environment Mitigation Levy under the Biodiversity Conservation Strategy (BCS) Melbourne's Growth Corridors (DEPI 2013).

The site has recently been acquired by Cleanaway and is currently being used for agriculture (cattle grazing) and is heavily modified, with a residence and associated sheds in the central portion of the property. The site is predominantly low lying with several low rising stony knolls present throughout. Three large dams are located within the site and have previously inundated areas of the paddocks during past weather events.

Vegetation within the site consists predominantly of exotic pasture grasses including Perennial ryegrass *Lolium perenne*, Toowoomba Canary-grass *Phalaris aquatica*, Chilean Needle Grass *Nassella neesiana* and Yorkshire Fog *Holcus lanatas*. Scattered native species are present within the site, including Kangaroo Grass *Themeda triandra*, Blue Devil *Eryngium ovinum* and Rush *Juncus* spp, primarily within stony knolls and low-lying inundated areas within the site. Patches of insavies weeds such as Artichoke thistle *Cynara cardunculus* and Gorse *Ulex europaeus* are also present across the site.

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1.4 Golden Sun Moth

EPBC Act Conservation Status: Vulnerable

FFG Act Conservation Status: Vulnerable

Golden Sun Moth typically occurs in native grassland, grassy woodland, dominated by greater than 40% cover of wallaby-grass, in particular *Rytidosperma* spp. (Brown and Tolsma 2010; DSE 2004), but may also inhabit areas dominated by Kangaroo Grass *Themeda triandra* (Endersby and Koehler 2006) and introduced grassland dominated by Chilean Needle-grass (*Nassella neesiana*) and other introduced species. Male flight is typically low, to about a metre above the ground, fast and can be prolonged, but they are generally not recorded flying more than 100 metres from suitable habitat (Clarke and O’Dwyer 1999).



Plate 1. Golden Sun Moth (Ecology and Heritage Partners Pty Ltd)

Prior to European settlement, the Golden Sun Moth was widespread and relatively continuous throughout its range, inhabiting grassy open woodlands and grassland, although it now mainly inhabits small, isolated sites (DSE 2004). The species is threatened by habitat loss, disturbance and fragmentation due to agricultural expansion and urbanisation. Many populations are isolated and fragmented, impeding the ability of the relatively immobile females to recolonise areas, thereby reducing the likelihood of genetic exchange (DSE 2004). Such populations are therefore vulnerable as there is little likelihood of recolonisation in the event of a local extinction.

The proposal area at 510 Summerhill Road, Wollert, Victoria was identified as having suitable Golden Sun Moth habitat due to the occurrence of grassland dominated by Chilean Needle-grass *Nassella neesiana*, and recent records of Golden Sun Moth within 10 kilometres of the proposal area.

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2 METHODS

2.1 Nomenclature

Common and scientific names of vascular plants follow the Victorian Biodiversity Atlas (VBA) (DELWP 2022a) and the Census of Vascular Plants of Victoria (Walsh and Stajsic 2007). Vegetation community names follow DELWP's Ecological Vegetation Classes (EVC) benchmarks (DELWP 2022c). The names of terrestrial vertebrate and invertebrate fauna follow the Victorian Biodiversity Atlas (VBA) (DELWP 2022a).

2.2 Desktop Assessment

Relevant literature, online-resources and numerous databases were reviewed as part of this investigation to provide an assessment of flora and fauna values associated with the proposal area. The following information sources were reviewed:

- The DELWP NatureKit Map (DELWP 2022d) for modelled data for location risk, native vegetation patches, scattered trees and habitat for rare or threatened species
- The VBA for previously documented flora and fauna records within the project locality (DELWP 2022a)
- *Significant impact guidelines for the critically endangered Golden Sun Moth (*Synemon plana*)*. EPBC Act policy statement 3.12 (DEWHA 2009)
- Relevant federal and State legislation and policies, including the EPBC Act and FFG Act
- Aerial photography of the proposal area.

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2.3 Targeted Surveys

Surveys for Golden Sun Moth were undertaken in accordance with the recommended survey guidelines detailed in the significant impact guidelines for the species (DEWHA 2009).

Targeted surveys for Golden Sun Moth were undertaken on the 19 December 2022, 12 and 27 January 2023. Four separate attempts were made to conduct the final survey however due to poor weather conditions this survey was unable to be completed. Surveys were conducted by zoologists experienced in the detection and identification of the species. Surveys covered the entire proposal area, concentrating on areas of grassland identified as potential Golden Sun Moth habitat due to being dominated by exotic Chilean Needle-grass *Nassella neesiana*, which is a known food source for Golden Sun Moth (Figure 2).

Prior to conducting each survey, a reference site was checked at a nearby location with a known population of Golden Sun Moth. Reference sites are surveyed to confirm that the species is flying on a particular day. Golden Sun Moth were detected at reference sites on all three survey days, confirming the suitability of survey conditions at the time the surveys were undertaken across the proposal area.

Areas of suitable habitat were walked by qualified zoologists over three separate days during the known flight season (i.e. November to early January). Surveys were undertaken at a time which is considered suitable for detecting the species (i.e. between 10am and 3pm on warm (over 20°C by 10am) days with minimal cloud cover and still conditions).

2.4 Assessment Qualifications and Limitations

It is important to acknowledge that the number of documented records for Golden Sun Moth within and surrounding the proposal area is not necessarily a reflection of population size or density. Furthermore, a documented record may indicate a species' presence in an area at a given point in time, but it generally does not offer information about how a species is making use of an area (e.g. foraging, dispersing, reintroducing, etc.). This can be important information when determining the potential impact of a proposed action on a threatened species.

The survey guidelines (DEWHA 2009) recommend against surveying across two consecutive days or within two days following heavy rainfall, with four surveys recommended to determine species presence or absence. Based on past information, the typical Golden Sun Moth flight season commences in late November to early December, with moths confirmed to be flying around Melbourne at occupied sites through to late January. The 2022/23 season was heavily impacted by atypical wet and cold conditions throughout the Golden Sun Moth survey season, which limited days available to conduct surveys in optimal conditions. As such, only three surveys were completed for the proposal area, with four attempts made to conduct the final survey on 19 and 24 January and 1 and 6 February 2023. The fourth survey was unable to be conducted due to unfavourable conditions.

Fauna surveys were conducted under the Ecology and Heritage Partners Pty Ltd research permit (#10009538) issued by DELWP under the *Wildlife Act 1975*.

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3 RESULTS

3.1 Desktop Assessment

There are approximately 2433 documented Golden Sun Moth records in the Victorian Biodiversity Atlas (VBA) dated between 2012-2021 within a 10-kilometre radius of the proposal area, with the most recent being in 2021 (DELWP 2022a). Most of these Golden Sun Moth were observed at Aurora Conservation Reserve in Epping, approximately 10 kilometres from the proposal area (Figure 3).

As Golden Sun Moth are known to inhabit introduced grasslands dominated by Chilean Needle-grass, there is potential for Golden Sun Moth habitat to occur within the proposal area. However, the history of disturbance at the site (e.g. planting of exotic species, extensive weed invasion, farming of livestock) is likely to have resulted in the degradation of existing habitat. As it is unlikely that Golden Sun Moth has since recolonised these highly disturbed areas, these sections of the proposal area were considered unsuitable Golden Sun Moth habitat. The small size of the proposal area further suggests a low likelihood of the proposal area supporting a population of Golden Sun Moth.

3.2 Survey Results

No Golden Sun Moth were detected within the proposal area during the surveys. It must be noted that surveys on 11 January were not fully completed due to time constraints, and therefore two remaining paddocks were surveyed on 12 January. Surveys on 24 January were attempted and then cancelled due to unpredicted rain, with a small area of the site being surveyed. A summary of weather conditions and survey results is provided in Table 1.

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Golden Sun Moth was recorded at reference sites on all occasions (Table 2) confirming the suitability of survey conditions at the time of the surveys undertaken across the proposal area. Species observed onsite included Common brown butterfly *Heteronympha merope*, Cabbage white butterfly *Pieris rapae*, Cunninghams Skink *Egernia cunninghami*, Shingleback Lizard *Tiliqua rugosa* and Red Fox *Vulpes vulpes*.

Table 1. Golden Sun Moth survey site weather conditions and results

Date	Survey times	Temperature (°C) (start and end of survey)		Wind (km/hr)	Cloud cover (%)	No. of days since rain	No. Golden Sun Moth recorded within the proposal area
19/12/2022	10:00-15:00	21	24.8	18	10	2	0
11/01/2023	10:00-15:00	24.4	32.7	5.5	0	6	0
12/01/2023	10:00-15:00	23	23	25.9	0	7	0
24/01/2023	10:00-15:00	21.6	22	22.2	60	4	0
27/01/2023	10:00-15:00	21.9	28.9	7.4	0	1	0

Note 1: Bureau of Meteorology (BOM) weather for Melbourne Airport Weather Station. 10 kilometres from Broadmeadows Valley Park, Victoria (January 2023), Australian Government, ACT.

Table 2. Golden Sun Moth survey reference site weather conditions and results

Date	Survey times	Temperature (°C) (start and end of survey)		Wind (km/hr)	Cloud cover (%)	No. of days since rain	No. Golden Sun Moth recorded within the proposal area
19/12/2022	10:00-15:00	21	24.8	18	10	2	2
11/01/2023	10:00-15:00	24.4	32.7	24	40	6	2
12/01/2023	10:00-15:00	23	23	13	100	7	2
24/01/2023	10:00-15:00	21.6	22	3	70	4	4
27/01/2023	10:00-15:00	21.9	28.9	11.1	0	1	1

Note 1: Bureau of Meteorology (BOM) weather for Melbourne Airport Weather Station. 10 kilometres from Broadmeadows Valley Park, Victoria (January 2023), Australian Government, ACT.

3.3 Habitat Assessment

Small patches of native Wallaby Grass *Rytidosperma caespitosum* and Kangaroo Grass *Themeda triandra* were identified within low stony knolls due to the past geological history promoting shallow well drained soil, suitable for native species (DELWP 2022b) (Plate 2 and Plate 3). Some native *Eucalyptus* trees occur along the northern boundary with several scattered in the centre of the property (Plate 4).

The site supports large open areas of non-native grasses and is dominated by Perennial ryegrass *Lolium perenne*, Toowomba Canary-grass *Phalaris aquatica*, Yorkshire Fog *Holcus lanata* and Chilean Needle-grass *Nassella neesiana*. Areas with a high cover of Chilean Needle-grass *Nassella neesiana* are known to be a preferred food source for Golden Sun Moth. Substantial cover of Chilean Needle-grass *Nassella neesiana* occurred throughout most of the proposal area and was considered potential habitat for Golden Sun Moth (Plate 5). Low lying areas near the dams contained high proportions of unsuitable Juncus grasses and waterlogged soil (Plate 6). Whilst the south-eastern section of the proposal area contained some unsuitable habitat with high levels of disturbance and large quantities of Toowomba Canary-grass (Plate 7).

The remainder of the proposal area comprised of patches of the invasive weed Artichoke thistle *Cynara cardunculus* and Gorse *Ulex europaeus*. Numerous exotic shrubs were present throughout the site such as African Boxthorn *Lycium ferocissimum*.

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Plate 2. Low lying Stony Knolls present within the proposal area (Ecology and Heritage Partners Pty Ltd 06/02/2023).



Plate 3. Kangaroo grass growing between Stony Knolls (Ecology and Heritage Partners Pty Ltd 06/02/2023).



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Plate 4. Native eucalypt trees along the northern proposal area boundary (Ecology and Heritage Partners Pty Ltd 29/11/2022).



Plate 5. Open areas of grassland dominated by Chilean Needle-grass *Nassella neesiana* within the proposal area (Ecology and Heritage Partners Pty Ltd 06/02/2023).



Plate 6. Juncus grasses located near southern dam (Ecology and Heritage Partners Pty Ltd 29/11/2022).



Plate 7. Cattle within the proposal area disturbing soil (Ecology and Heritage Partners Pty Ltd 07/02/2023)

4 LEGISLATIVE AND POLICY IMPLICATIONS

4.1 Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

The EPBC Act establishes a Commonwealth process for the assessment of proposed actions (i.e. project, development, undertaking, activity, or series of activities) that are likely to have a significant impact on MNES, or on Commonwealth land. An action, unless otherwise exempt, requires approval from the Commonwealth Environment Minister if it is considered likely to have an impact on any MNES.

The criteria for assessing a significant impact to the vulnerable Golden Sun Moth is detailed below in Table 3.

Table 3. Significant impact thresholds for the Golden Sun Moth (DEWHA 2009).

Ecological element affected	Impact threshold	Comment
Large or contiguous habitat area (>10ha)	Habitat loss, degradation or fragmentation >0.5 ha.	Not applicable as the suitable habitat within the proposal area is not large or contiguous (i.e. it is <10ha) and no GSM were observed.
Small or fragmented habitat area (<10ha)	Any habitat loss, degradation or fragmentation	There is a small area of suitable habitat within the proposal area (< 10ha), however no GSM were observed during the site visits and therefore impacts to suitable habitat will not be considered significant.
Habitat connectivity	Fragmentation of populations through the introduction of a barrier to dispersal. Barriers to dispersal could include breaks in habitat of >200 m, structures that prohibit movement (for example buildings, solid fences)	Given that no GSM were observed during targeted surveys, it is unlikely that any development of the proposal area would result in the fragmentation of connectivity between habitats.

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4.1.1 Implications

Despite the surveys being undertaken during appropriate seasonal conditions in accordance with the recommended survey method, no Golden Sun Moth were recorded within the proposal area. As such, a population of the species is unlikely to be present within the proposal area and therefore the species and associated habitat will not be significantly impacted by the proposed development.

4.2 Flora and Fauna Guarantee Act 1988 (Victoria)

The FFG Act is the primary legislation dealing with biodiversity conservation and sustainable use of native flora and fauna in Victoria. Proponents are required to apply for an FFG Act Permit to ‘take’ listed and/or protected flora species, listed vegetation communities and listed fish species in areas of public land (i.e. within road reserves, drainage lines and public reserves). An FFG Act permit is generally not required for removal of species or communities on private land, or for the removal of habitat for a listed terrestrial fauna species.

Although the proposal area is privately owned and therefore a permit to remove protected flora species, listed vegetation communities and listed fish species is not required, the Responsible Authority and/or the Department of Energy, Environment and Climate Action (DEECA) take into consideration the presence of FFG

Act matters (e.g. species, ecological communities and threatening processes) as part of the strategic and statutory assessment and approval process (e.g. rezoning and planning permit application). Despite targeted surveys being undertaken during an appropriate survey period and conditions, Golden Sun Moth was not recorded within the proposal area. Consequently, there are no implications under the FFG Act relating to these species for any future development of the proposal area.

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5 CONCLUSION

Targeted surveys for Golden Sun Moth were undertaken on 19 December 2022, 12 and 27 January 2023. Surveys concentrated on areas identified as potential habitat, primarily those dominated by the exotic Chilean Needle-grass which is a known food sources for Golden Sun Moth.

Despite targeted surveys been undertaken during optimal survey conditions when the species was known to be flying at reference sites the species was not detected within the proposal area. As such, based on available information a resident population does not exist within the proposal area and the species will not be impacted by the proposed development of the proposal area.

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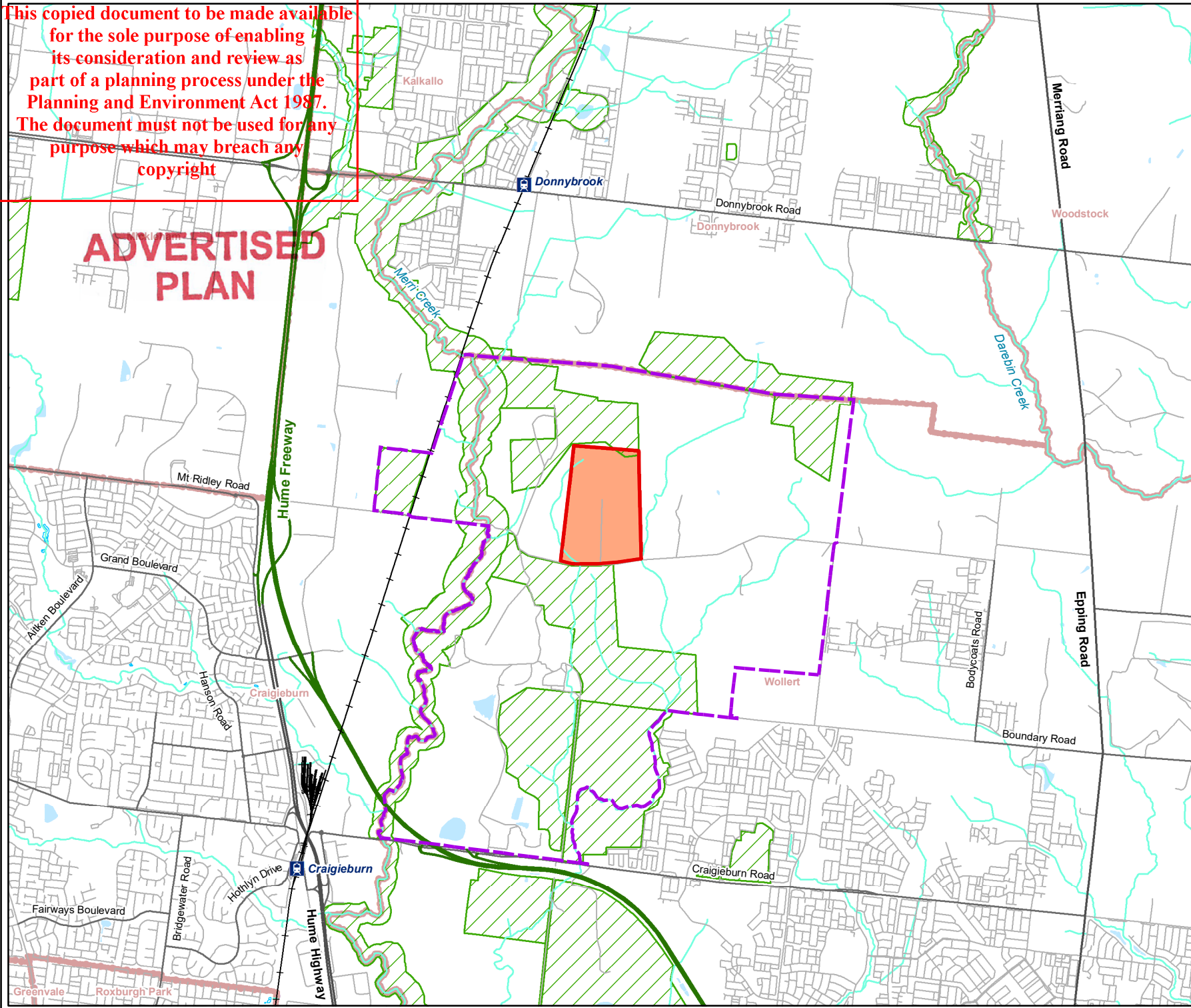
FIGURES

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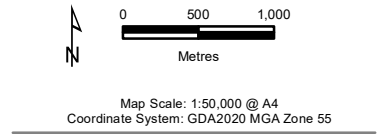
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- Legend**
- Proposal Area
 - Northern Quarries PSP
 - Railway
 - Freeway
 - Major Road
 - Collector Road
 - Minor Road
 - Minor Watercourse
 - Permanent Waterbody
 - Wetland/Swamp
 - BCS Conservation Area
 - Localities



Figure 1
Location of the proposal area
Targeted Golden Sun Moth surveys for 510 Summerhill Road, Wollert



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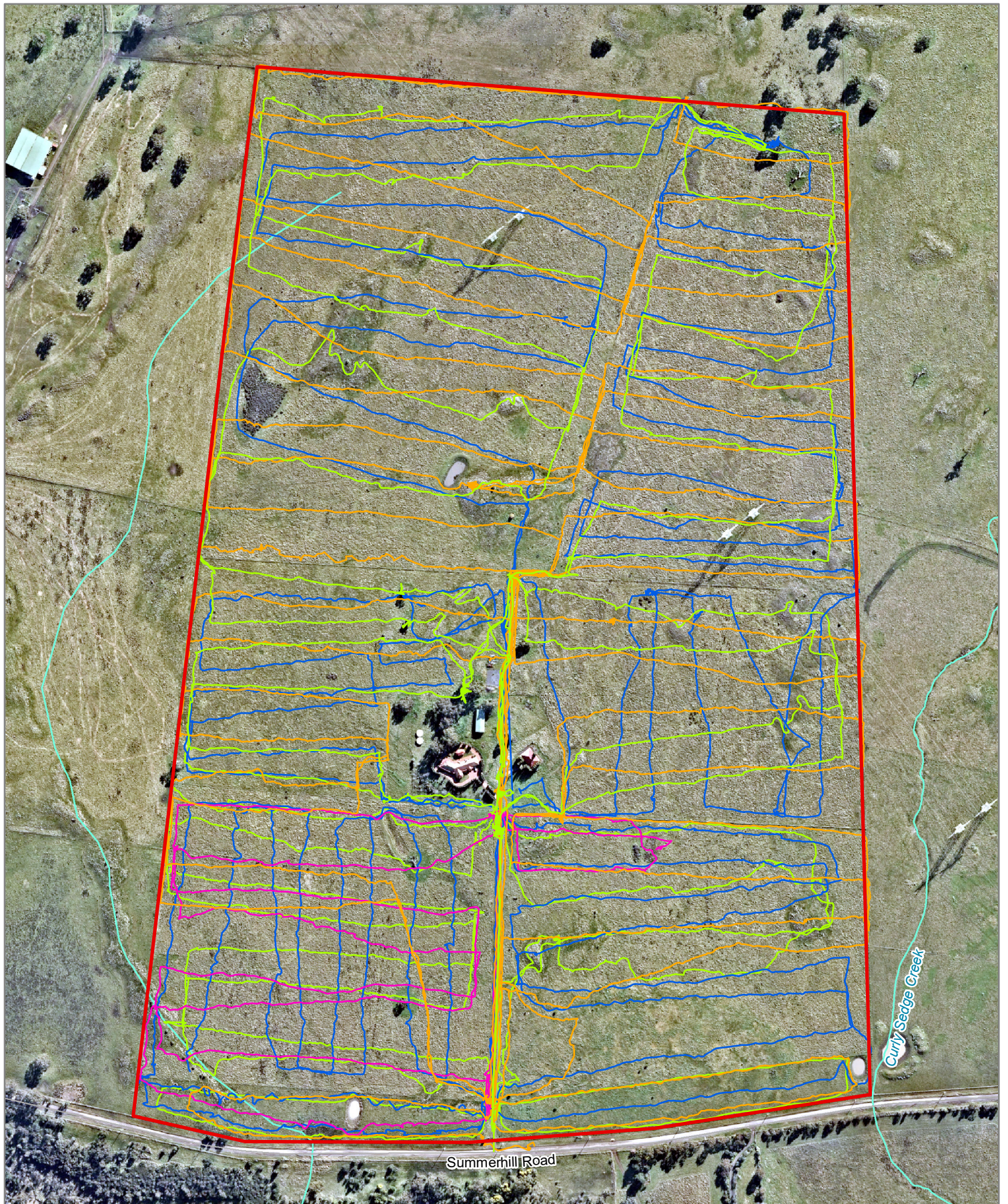
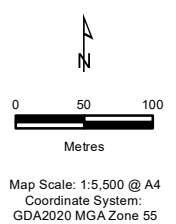
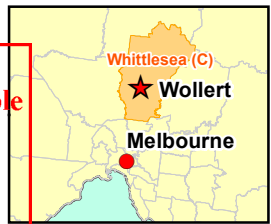


Figure 2
Survey results
 Targeted Golden Sun
 Moth surveys for 510
 Summerhill Road, Wollert

- Legend**
- Proposal Area
 - Minor Watercourses
 - Survey transects**
 - 19/12/2022
 - 12/01/2023
 - 24/01/2023
 - 27/01/2023

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Legend

- Proposal Area
- Northern Quarries PSP
- 10km buffer
- Minor Watercourse

Golden Sun Moth records (VBA 2022)

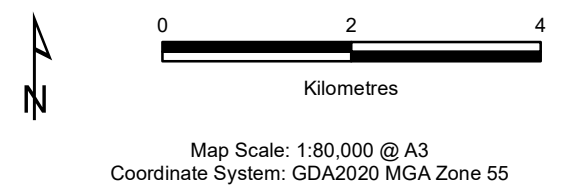
- 2020-2022
- 2010-2019
- 2000-2009
- 1990-1999
- 1970-1989
- 1950-1969

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Figure 3
Previously documented Golden Sun Moth records within 10km of the proposal area
Targeted Golden Sun Moth surveys for 510 Summerhill Road, Wollert



Victorian Biodiversity Atlas (VBA) // Sourced from: 'VBA_FLORA25', 'VBA_FLORA100', 'VBA_FAUNA25' and 'VBA_FAUNA100'. Updated November 2022 © The State of Victoria, Department of Energy, Environment and Climate Action. Records prior to 1949 not shown.

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