20 January 2020

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Block 7, Section 4, Yarralumla, ACT – Targeted Golden Sun Moth Survey

Capital Ecology project no. 2878

Dear Mr Micallef,

This letter provides the methods and results of Capital Ecology's targeted ecological surveys at Block 7, Section 4, Yarralumla, ACT (the 'study area') from October 2019 to December 2019.

A targeted survey for the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) critically endangered Golden Sun Moth *Synemon plana* ('GSM') was conducted to address recommendations from Capital Ecology's 2019 Ecological Values and Constraints Assessment[1] (EVCA). The EVCA identified several small patches of vegetation (total area = 1.16 ha) with the potential to support the GSM. The targeted survey was therefore performed to confirm the presence/absence of the GSM within these patches.

Figure 1 shows the location of the study area within the locality, Figure 2 show the extent of potential GSM habitat, Figure 3 show the location and results of the targeted surveys, and Figure 4 shows the extent of confirmed GSM habitat.

The results of the targeted survey are presented in detail in the following sections. In summary, 10 spontaneously flying GSM males were recorded in two separate areas during the survey program. These two areas (total area = 0.56 ha) are therefore identified as confirmed GSM habitat.

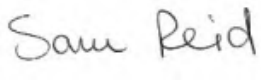
An EPBC Act referral would be required should the proponent wish to impact the areas identified as confirmed GSM habitat. However, given the small area and degraded condition of the confirmed habitat, the small size of the GSM population, and the low potential population viability, we expect that

[1] Capital Ecology (2019). *Ecological Values and Constraints Assessment for Block 7, Section 4, Yarralumla, ACT*. Project No. 2847, 8 August 2019.

the impact would not be considered significant and therefore the decision of any such referral would be a 'not-controlled action'.

We trust that this letter provides the information required. If, however, you should have any questions, please do not hesitate to contact us.

Yours sincerely,



Robert Speirs

Director / Principal Ecologist

Dr Sam Reid

Senior Ecologist

Attachments:

Figure 1. Locality Plan

Figure 2. Potential Golden Sun Moth Habitat

Figure 3. Golden Sun Moth Surveys

Figure 4. Confirmed Golden Sun Moth Habitat

Golden Sun Moth targeted survey

Golden Sun Moths, listed as critically endangered pursuant to the EPBC Act and endangered pursuant to the ACT *Nature Conservation Act 2014* (NC Act), are known to occur in open grassland within close proximity to the study area. The EVCA conducted by Capital Ecology identified several small patches of vegetation within the study area that contain the characteristics necessary to support GSM. These open grassy areas contain a moderate to high component of *Rhytidosperma* spp. and/or the exotic weed Chilean Needle Grass *Nassella neesiana*, both of which are known to be important GSM food species.

Accordingly, the aims of Capital Ecology's targeted survey were to confirm the presence/absence of GSM in the identified patches of potential habitat (total area = 1.16 ha), and if present, to assess and map the extent and condition of the habitat.

Methodology

A program of four targeted GSM surveys was undertaken in accordance with the following guidelines:

- *Background Paper to EPBC Act Policy Statement 3.12 - Significant Impact Guidelines for the Critically Endangered Golden Sun Moth (Synemon plana)*[2]; and
- the ACT Government Conservation Research Unit's survey guidelines (ACT Government 2014)[3].

Each survey involved one ecologist walking transects approximately 10-20 m apart across the estimated extent of potential habitat (refer Figure 3). All male GSM flights observed (usually up to 20 m ahead or to either side of the ecologist), were marked via a hand-held GPS.

On each survey day, moths were confirmed to be flying in the ACT region via pre-survey checks of known habitat in nearby areas and/or email and phone communication with other ecologists conducting GSM surveys in the region.

A GPS track was recorded for each survey; these are shown on Figure 3. As shown on Figure 3, effort was made to vary the alignment of the transects between surveys in order to achieve the best possible coverage of the survey area. Whilst the surveys are primarily focused on recording male GSM flights, the ecologist also examined the ground for female moths and pupal cases.

Results

A total of 10 male GSM were recorded across the four surveys. No female GSM and no pupal cases were recorded. Surveys were conducted through all patches of suitable habitat (refer Figure 3) during suitable survey conditions (refer Table 1). GSM were observed to be active at medium to high densities at other reference sites in the ACT and nearby NSW on each survey day.

Eight male GSM were recorded flushed and spontaneously flying on 11 November 2019, with six recorded in the north-west patch of identified potential habitat and two in the south-east patch. Two male GSM were recorded spontaneously flying on 22 November 2019 in the south-east patch of potential habitat.

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[2] Commonwealth of Australia (2009). *Background Paper to EPBC Act Policy Statement 3.12 - Significant Impact Guidelines for the Critically Endangered Golden Sun Moth (Synemon plana)*. Department of Environment, Water, Heritage and the Arts.

[3] ACT Government (2014). *Survey Guidelines for Golden Sun Moth*. Conservation, Planning and Research, Environment and Sustainable Development Directorate.

Based on observations from the study area and additional GSM survey sites throughout the ACT and NSW, it is important to note that the 2019 GSM flying season was unusual in comparison to previous years in that it started early (from late October), was short (ending by approximately the first week of December), and included large numbers of moths flying during non-ideal conditions (e.g. during windy days). This unusual season was likely due to the dry winter and early spring followed by dry and hot conditions prior to and throughout the flying season. In addition, we found that GSM were widely observed at moderate to high densities across most of our project sites in 2019, including sites in Yass, Murrumbateman, Sutton, and various locations across the ACT.

Table 1. Golden Sun Moth targeted survey conditions

Date: 30/10/2019 (Survey 1)				**Observer/s:** SR
Survey Site: CSIRO Yarralumla				
Time	**Air Temp.**	**Wind**	**Cloud cover**	**Other weather information**
Start: 1315	27.0	15 NNW	7/8	Warm and relatively still
Finish: 1345	27.4	19 N	6/8	
General site notes: Males confirmed flying near Sutton and via ACT GSM email forum.				
Date: 11/11/2019 (Survey 2)				**Observer/s:** SR
Survey Site: CSIRO Yarralumla				
Time	**Air Temp.**	**Wind**	**Cloud cover**	**Other weather information**
Start: 1240	23.6	30 NW	0/8	
Finish: 1320	24.0	28 WNW	0/8	
General site notes: Male GSM recorded both flushed and spontaneously flying. Males confirmed flying near Sutton and via ACT GSM email forum.				
Date: 22/11/2019 (Survey 3)				**Observer/s:** SR
Survey Site: CSIRO Yarralumla				
Time	**Air Temp.**	**Wind**	**Cloud cover**	**Other weather information**
Start: 1220	32.0	32 NW	8/8	Entire sky covered in dust haze
Finish: 1300	33.3	35 NNW	8/8	
General site notes: Male GSM recorded spontaneously flying. Males confirmed flying near Gungahlin.				
Date: 29/11/2019 (Survey 4)				**Observer/s:** RS
Survey Site: CSIRO Yarralumla				
Time	**Air Temp.**	**Wind**	**Cloud cover**	**Other weather information**
Start: 1200	30.5	20 NW	0/8	Very dry conditions
Finish: 1240	29.5	20 NW	0/8	
General site notes: Males observed flying at Yarralumla Brickworks and near Queanbeyan Nature Reserve, NSW.				

Discussion

The confirmed GSM habitat in the study area is comprised of two small patches (total area = 0.56 ha) of low-quality grassland (Figure 4). The southern patch (area = 0.33 ha) contains a groundstorey dominated by Chilean Needle Grass, African Love Grass *Eragrostis curvula*, and Couch Grass *Cynodon dactylon*. The northern patch (area = 0.22 ha) contains a groundstorey of native grasses, comprising several Wallaby Grass species, Red-leg Grass *Bothriochloa macra*, and Tall Speargrass *Austrostipa bigeniculata*, with a mixture of the exotic grasses found throughout. It is unlikely that the confirmed habitat provides an important component of any functional link between the populations found 350 m to the east on Stirling Ridge or 500 m to the south along Dudley St, Yarralumla.

Given the small size of the estimated habitat and the low number of GSM recorded, the GSM in the study area represent only a very minor portion of the GSM population in the locality and in the broader ACT region. Furthermore, the population is small and isolated from other larger areas of habitat, and the habitat is subject to a high degree of ongoing threats from noxious weed proliferation, moving, and other activities. In combination, these factors indicate that the long-term viability of the population in the study area is low.

In summary, the confirmed GSM habitat in the study area is of low quality and is unlikely to be a significant to the conservation of the species in the locality. Notwithstanding this, as the GSM is listed as critically endangered under the EPBC Act, an EPBC Act referral will be required should any future development impact the areas of confirmed GSM habitat. However, given the small area and degraded condition of the confirmed habitat, the small size of the GSM population, and the low potential population viability, we expect that the impact would not be considered significant and therefore the decision of any such referral would be a 'not-controlled action'.

Given the small size of the estimated habitat and the low number of GSM recorded, the GSM population in the study area represents only a very minor portion of GSM in the ACT. Furthermore, the small population of GSM in the study area combined with the degraded condition of the habitat and ongoing threats from noxious weeds and human activities suggest that the long-term viability of the population in the study area is low.

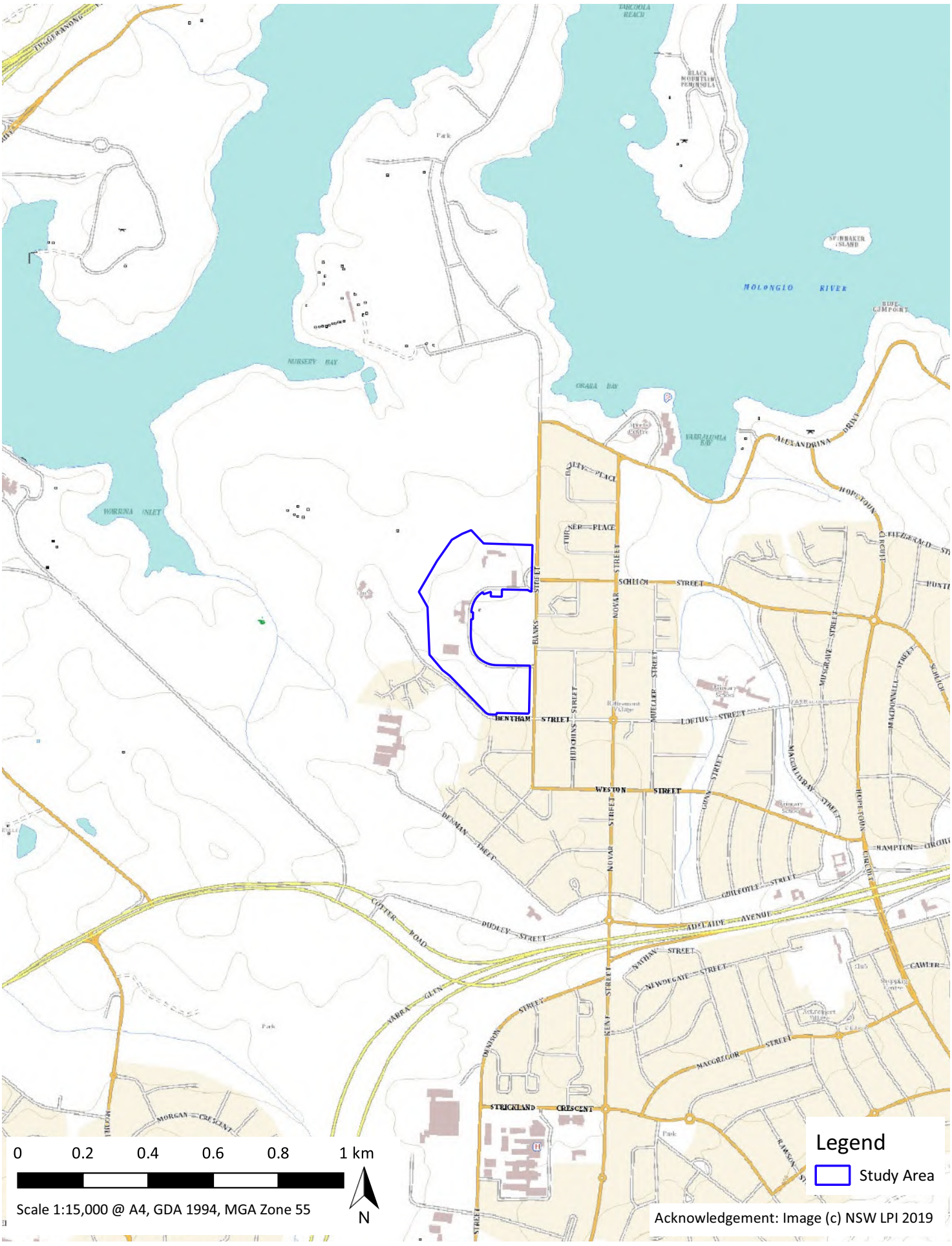

Figure 1. Locality Plan

Capital Ecology Project No: 2878
Drawn by: S. Thompson
Date: 17 December 2019

Figure 2. Potential Golden Sun Moth Habitat

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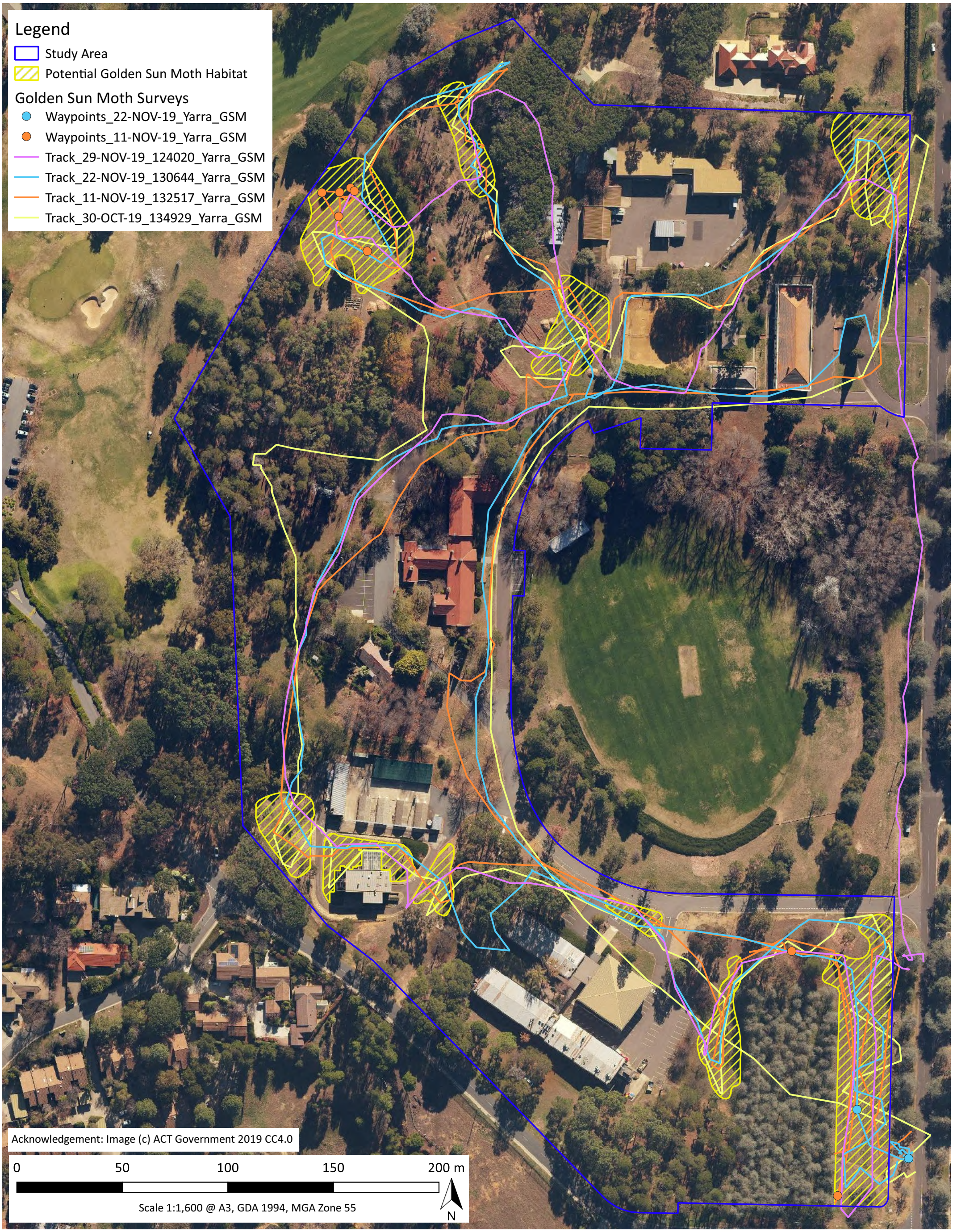

Figure 3. Golden Sun Moth Surveys

Capital Ecology Project No: 2878
Drawn by: S. Thompson
Date: 17 December 2019

Figure 4. Golden Sun Moth Confirmed Habitat

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Drawn by: S. Thompson
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