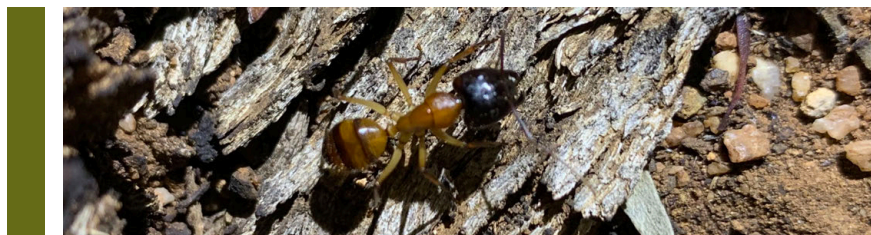
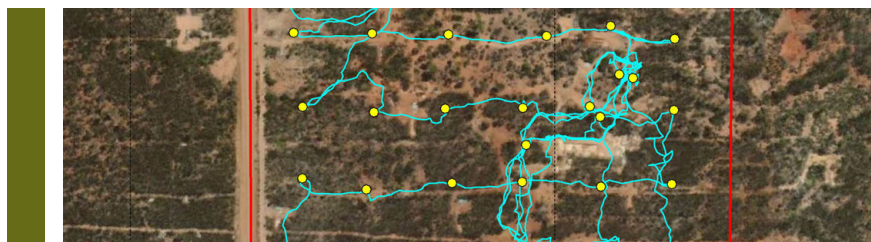
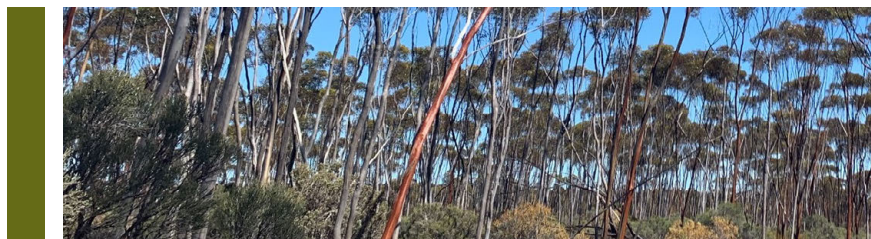
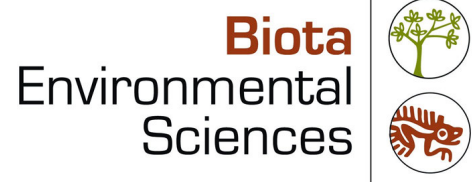


New Morning Arid Bronze Azure Butterfly Habitat Assessment



Western Areas NL

March 2021



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ABN 49 092 687 119
Level 1, 228 Carr Place
Leederville Western Australia 6007
Ph: (08) 9328 1900 Fax: (08) 9328 6138

Project No.: 1586

Prepared by: V Ford

Document Quality Checking History

Version:	Rev 0	Peer review:	G. Humphreys
	Rev 0	Director review:	G. Humphreys
	Rev 0	Format review:	G. Humphreys

Approved for issue: G. Humphreys

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ABAB Habitat Assessment

Contents

1.0	Introduction	7
2.0	Methods	9
2.1	Timing and Survey Effort	9
2.2	Personnel and Permits	9
3.0	Results	11
3.1	Habitat Assessment	11
4.0	Discussion	17
5.0	References	19

Figures

Figure 2.1:	Search effort for the host ant, <i>Camponotus</i> sp. nr. <i>terebrans</i> .	10
Figure 3.1:	Location of <i>Camponotus nigriceps</i> nests and individuals.	15

Plates

Plate 3.1:	Mallee eucalypt over <i>Allocasuarina</i> shrubland within study area	11
Plate 3.2:	Low forest of mixed eucalypt within study area.	12
Plate 3.3:	Salmon Gum dominated eucalypt woodland within study area.	12
Plate 3.4:	Example of major worker <i>Camponotus nigriceps</i> recorded during the survey (note stripes on gaster).	13
Plate 3.5:	Example of major worker <i>Camponotus</i> sp. nr. <i>terebrans</i> (stock photograph).	13
Plate 3.6:	Basal tree nest of <i>Camponotus nigriceps</i> .	14

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1.0 Introduction

Until its rediscovery at Barbalin Nature Reserve in 2006, there were fears that the Arid Bronze Azure Butterfly (ABAB), *Ogyris subterretris petrina* was extinct (Williams et al. 2018). It is currently only known from two locations in Western Australia, one in the Wheatbelt and one in the Goldfields, and is listed as critically endangered under the national *Environment Protection and Biodiversity Protection Act 1999* and the state *Biodiversity Conservation Act 2016*.

With the release of species-specific survey guidelines by the Department of Biodiversity Conservation and Attractions (DBCA 2020a), Western Areas NL commissioned Biota Environmental Sciences (Biota) to undertake a habitat assessment in relation to the butterfly. The ABAB has an obligate association with the sugar ant known as *Camponotus* 'species near' (sp. nr.) *terebrans*, with the larvae of the butterfly residing and receiving protection within the nests of the ant. The butterfly has only been found in association with large colonies of the ant and therefore, determining habitat presence essentially comprises a search for nests of the ant.

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2.0 Methods

2.1 Timing and Survey Effort

The survey was undertaken on the afternoon and evening/night of 9 March 2021. Conditions on the day were clear and warm to hot with a maximum temperature of 32.6°C.

Given that large colonies of the ant (as required to support the ABAB) are obvious around the base of trees (DBCA 2020a), the search for ant nests commenced in the afternoon then continued into the evening so that any potential nesting evidence recorded during the afternoon could be revisited in the evening when the ants would be active and identifiable.

Colonies of the ant occur at the base of mature smooth-barked eucalypts and in accordance with the DBCA (2020a) guidance, the appropriate number of trees to be sampled was calculated as follows:

- No. sample trees = $10 \times \sqrt{\text{site area in hectares}}$,
- Spacing = $\sqrt{[(\text{site area in hectares} \times 10,000) / \text{No. sample trees}]}$

For the 62 ha study area, this indicates 78 trees should be visited at a grid spacing of 89 m between sampling trees. This grid was generated and placed randomly over the study area in MapInfo Professional Geographic Information Software (GIS) v11 and then loaded onto a tablet with high-accuracy GPS capability. As the study area is not completely vegetated, with exploration clearing throughout, the calculated search effort of 78 trees effectively exceeded that recommended by DBCA (2020a).

For each point on the grid, the closest smooth-barked eucalypt tree was visited, the location recorded and the base of the tree searched for evidence of nests and/or ants. For every tree assessed, the diameter at breast height (DBH) was either measured, or for smaller trees, estimated and where possible the tree species was identified or at least described (e.g. if form was mallee). Photographs of the trees were also taken to aid in later identification. While walking between trees, a general visual sweep of the ground was undertaken at trees between sampling points, especially when traversing besides roads and other disturbance areas where the ants are typically more abundant (DBCA 2020b).

Descriptions of habitat were made whenever a distinct habitat type was encountered during traverses. This comprised broad vegetation type, surface soil and material, landform, previous disturbance, and representative photographs. Site descriptions were then considered in the context of the vegetation descriptions of Botanica Consulting (2018) which was used to assist in the identification of tree species and the distribution of each habitat type over the study area.

When nests and ants with potential to represent the host species were located, a GPS waypoint was taken together with photographs of the nest and surrounding habitat. Photographs of individuals were also taken and 1-2 individuals collected and preserved for later identification at the WA Museum. The locations of survey points and the trackfile recorded by zoologists traversing are shown in Figure 2.1.

2.2 Personnel and Permits

This survey was conducted with a Fauna Taking (biological assessment) Licence BA27000375 (Regulation 27, BC Act).

The survey was undertaken by zoologists Dr Victoria Ford and Dr Sylvie Schmidt, both of Biota. Prior to the survey, advice on the appearance and habit of the target ant species was obtained from Dr Brian Heterick (WA Museum). After the survey, specimens were submitted to Dr Heterick for identification.

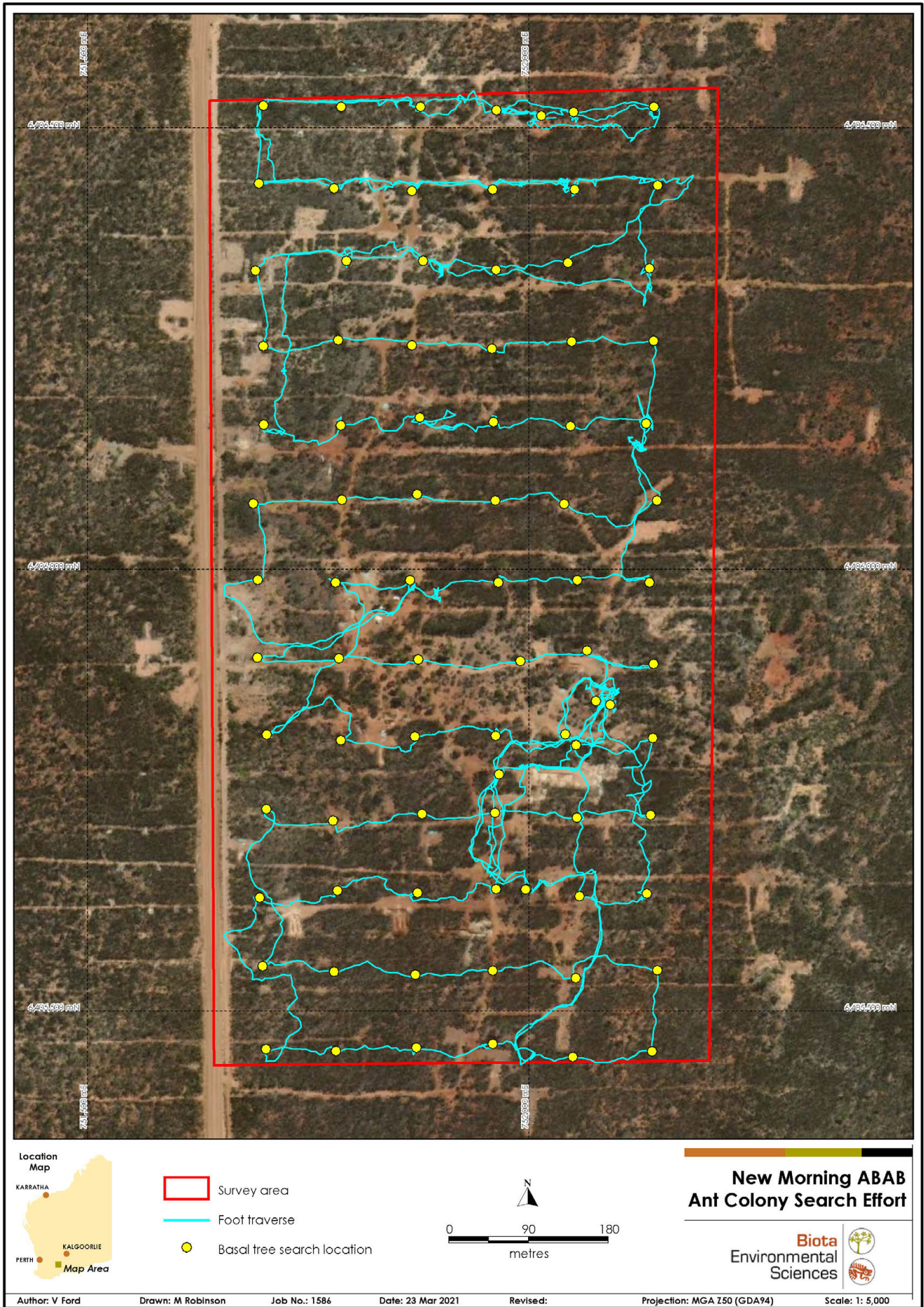


Figure 2.1: Search effort for the host ant, *Camponotus* sp. nr. *terebrans*.

3.0 Results

3.1 Habitat Assessment

The study area was dominated by smooth barked eucalypt woodland. Mallee woodlands and shrublands occurred on the stony rises over much of the western third of the study area (Plate 4.1). Low open forests of mixed *Eucalyptus* species including Gimlet (*Eucalyptus salubris*), *E. flocktoniae* and *E. urna* occur on clay-loam plains in the north-east and over much of the southern extend of the study area (Plate 4.2) (Botanica Consulting 2018). The remaining centre and east of the study area was dominated by Salmon Gum (*E. salmonophloia*) woodland (Plate 4.3).

The south-west of the study area, which was also dominated by eucalypt woodland, had been burnt in 2020 but was still searched.



Plate 3.1: Mallee eucalypt over *Allocasuarina* shrubland within study area



Plate 3.2: Low woodland of mixed eucalypt within study area.



Plate 3.3: Salmon Gum dominated eucalypt woodland within study area.

No ants of the host species *Camponotus* sp. nr. *terebrans* were found during the survey. Ants of the congener *C. nigriceps* were found. Plate 4.4 is a photograph of a *C. nigriceps* major worker located during the survey while a stock photograph of *C. sp. nr. terebrans* is shown in Plant 4.5 for comparison; the stripes on the gaster (the rear major body segment) on *C. nigriceps* are a notable difference between the two species (Dr Brian Heterick pers. comm. 2021).



Plate 3.4: Example of major worker *Camponotus nigriceps* recorded during the survey (note stripes on abdomen).



Plate 3.5: Example of major worker *Camponotus* sp. nr. *terebrans* (stock photograph).

The nests of the *C. nigriceps* were in an area dominated by a mature thick trunked mallee eucalypts. In addition to two nests found at the base of trees like that shown in Plate 4.5, an apparent smaller nest was found in the open, on a track, and had a single crescent opening which numerous workers were observed using.



Plate 3.6: Basal tree nest of *Camponotus nigriceps*.

The location of *C. nigriceps* nests and concentrations of wandering individuals recorded are shown Figure 3.1.

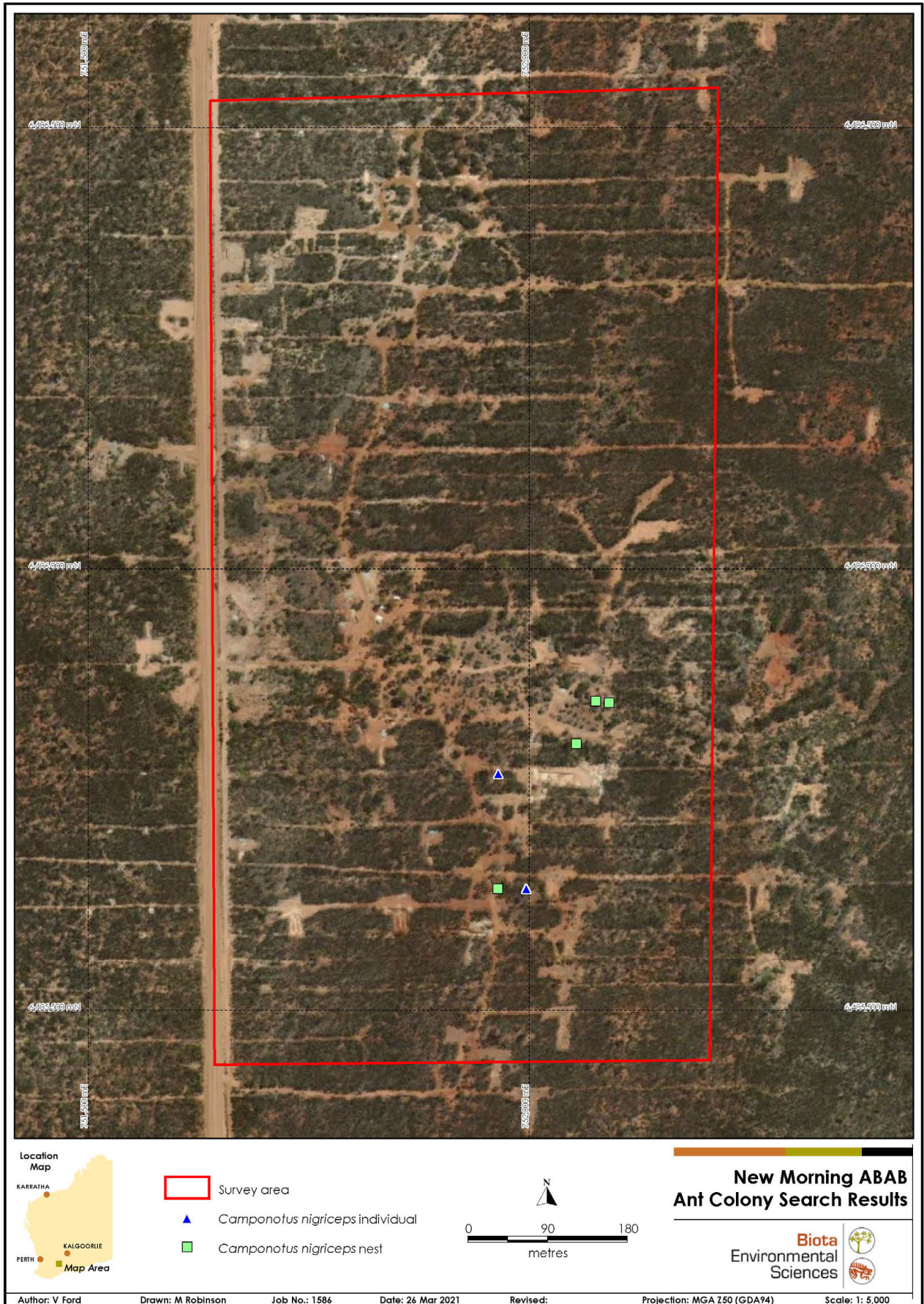


Figure 3.1: Location of *Camponotus nigriceps* nests and individuals.

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4.0 Discussion

A thorough search of the study area was undertaken for nests and ants of the host species *Camponotus* sp. nr. *terebrans*. No nests of the target species were found and instead congener *C. nigriceps* was present.

Survey guidance for the ABAB (DBCA 2020b) indicate that direct survey for the ABAB is only recommended if a large colony of the host ant *C. sp. nr. terebrans* is present. As such, ABAB surveys at the New Morning study area do not appear warranted.

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