Survey of the Ngaanyatjarra Indigenous Protected Area for the Common Brown butterfly, *Heteronympha merope*

Research report to the Ngaanyatjarra Council (Aboriginal Corporation) Land and Culture

By Dr Michael F. Braby

Museum and Art Gallery Northern Territory, GPO Box 4646, Darwin, NT 0801, Australia.

Email: michael.braby@nt.gov.au

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Location of study area: Rawlinson Ranges and Schwerin Mural Crescent, Ngaanyatjarra Indigenous Protected Area, WA

Date of visitation: 8-13 August 2010

Personnel: Michael Braby, Justin Armstrong, Neil Murray, Gavin Murray

Traditional Owner: Ernest Bennett

Introduction

The Common Brown butterfly, *Heteronympha merope* (Fig. 1), occurs in two disjunct areas on the Australian mainland where it is represented by two different subspecies. The subspecies *H. merope merope* occurs in south-eastern Australia (from central Qld through NSW, ACT, Vic to SA), while the subspecies *H. merope duboulayi* occurs in the south-western corner of WA that is separated from *H. merope merope* by the Nullarbor Plain. The taxonomic status of these subspecies is currently being investigated by M.F. Braby at MAGNT and N. Murray at La Trobe University. The species occurs mainly in temperate woodlands along the coast and foothills of the Great Dividing Range where rainfall is fairly high and predictable, and extends inland to semi-arid areas only where there is suitable habitat (e.g. along river corridors). It is not known to occur in the arid zone of central Australia. On 29-30 July 2000, Mr Clive Crouch visited the Rawlinson Ranges in the Ngaanyatjarra Indigenous Protected Area and observed a number of butterflies of a species which he believed to be the Common Brown or a species allied to it. However, because no specimens or photographs were recorded, the presence of the species in this remote part of Australia remains unconfirmed.

The purpose of this study was to undertake a preliminary field expedition to the Ngaanyatjarra IPA and sample the precise locations visited by C. Crouch, as well as other sites based on advice by local Traditional Owners. The primary aim was to confirm the presence of the butterfly in the area and determine if the species observed by Crouch was in fact the Common Brown. The presence of this butterfly in Ngaanyatjarra would be highly significant because it would constitute either a relictual population that has been isolated with the progressive drying of the continent during the Pliocene and formation of the arid zone, or an isolated population that has colonised the area more recently from remote source areas (e.g. Flinders Ranges, SA). If found to exist, the second aim was to determine the taxonomic status and relationships of the putative population in central Australia.

Methods

Seven sites were sampled in the Rawlinson Ranges and the adjacent Schwerin Mural Crescent, Ngaanyatjarra IPA, WA, during the period 8-13 August 2010 (Table 1; Figure 2).

Table 1. Locality data for the seven sites surveyed in the Rawlinson Ranges and adjacent areas during the period 8-13 August 2010. Note all coordinates are in decimal degrees and WGS84 datum.

Site	Location	Alt (m)	Latitude-Longitude	Prec-ision	Date
1	8 km NNE of Warakurna Roadhouse, Rawlinson Ranges, WA	600	24.97077ºS, 128.31631ºE	100m	08 Aug. 10
2	Circus Waterhole, Rawlinson Ranges, WA	480	24.75645ºS, 127.75253ºE	100m	10 Aug. 10
3	Waterhole near Fort McKellar, Rawlinson Ranges, WA	570	24.81165ºS, 127.87907ºE	100m	10 Aug. 10
4	Luehman's Springs, Rawlinson Ranges, WA	570	24.81833ºS, 127.92053ºE	250m	11 Aug. 10
5	2.5 km E of Luehman's Springs, Rawlinson Ranges, WA	550	24.82393ºS, 127.94470ºE	50m	11 Aug. 10
6	gorge near Mt Russell, 10 km NE of Warakurna Roadhouse, Rawlinson Ranges, WA	680	24.99367ºS, 128.39067ºE	10m	12 Aug. 10
7	Gill Pinnacle, Schwerin Mural Crescent, WA	700	24.89153ºS, 128.76907ºE	100m	13 Aug. 10

Each site was sampled for approx 90-120 mins, though longer periods were spent at sites 6 and 7. Butterflies were surveyed using sweep nets or visual search for the early stages (Figure 3). Sites were selected based on cultural knowledge of senior Traditional Owner Ernest Bennett (Figure 4). All sites comprised waterholes or steeply dissected gorges with permanent pools of water, frequently with patches of river red gum woodland in an otherwise dry rocky landscape. Weather conditions during the sampling period comprised cool, sunny days (max temp. low 20's) and cold nights, with one night of drizzle.

Results and Discussion

Ten species of butterflies were recorded during the survey (Table 2). However, the target species, the Common Brown, was not located despite the fact that most sites appeared to support small patches of suitable habitat (Fig. 3) and that Ernest was familiar with the female of this species. The failure to detect this species indicates that either it is absent from the study area or it is present but was not flying at the time of survey in mid August. However, consideration of the harsh arid climate of low and unpredictable rainfall of the region and dry rocky landscape with only small pockets of refugia suggest that the species is probably absent from the area. The butterflies observed by C. Crouch were probably of a different species, most likely the Lesser Wanderer, which is of a similar size to the Common Brown and which was the most frequently recorded species during the survey (Table 2).

Table 2. List of butterflies recorded in the Rawlinson Ranges and adjacent areas during the period 8-13 August 2010. Site numbers refer to those listed in Table 1.

Common Name	Scientific Name	Sites
Chequered Swallowtail	*Papilio demoleus*	2
Lemmon Migrant	*Catopsilia pomona*	4
White Migrant	*Catopsilia pyranthe*	7
Small Grass-yellow	*Eurema smilax*	1 4
Lesser Wanderer	*Danaus petilia*	1 2 3 4 7
Meadow Argus	*Junonia villida*	1 5 6
Australian Painted Lady	*Vanessa kershawi*	6
Satin Azure	*Ogyris amaryllis*	1 5 7
Northern Purple Azure	*Ogyris zosine*	5 7
Two-spotted Line-blue	*Nacaduba biocellata*	1 4 7

Most of the 10 butterflies recorded are common and widespread species of the arid zone of central Australia. Two exceptions are the White Migrant and the Northern Purple Azure. The White Migrant occurs predominantly in the semi-arid areas of the monsoon tropics and moister inland areas of eastern Australia, and has only rarely been recorded from central Australia. A single specimen of the White Migrant was recorded near Gill Pinnacle in Schwerin Mural Crescent and was possibly migrating through the region. The Northern Purple Azure 'arid form' has a very patchy, localised distribution in central Australia and there are very few records (totalling about 10 specimens) from the inland areas of WA. The species was found breeding at two sites: on a dry rocky west facing slope east of Luehman's Springs in the Rawlinson Ranges, and near Gill Pinnacle in Schwerin Mural Crescent. Larvae of this species were found associated with the mistletoe *Amyema sanguinea* and were attended by a black species of *Camponotus* ants. This species is considered to be the most significant butterfly recorded during the survey.

Acknowledgements

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Figure 1. Common Brown butterfly. Males shown on right, females on left. Top four specimens represent subspecies *Heteronympha merope merope*, bottom two specimens represent subspecies *H. merope duboulayi.*

Figure 2. Map of the Rawlinson Ranges and Schwerin Mural Crescent, Ngaanyatjarra IPA, showing location of sampling sites (numbers 1-7).

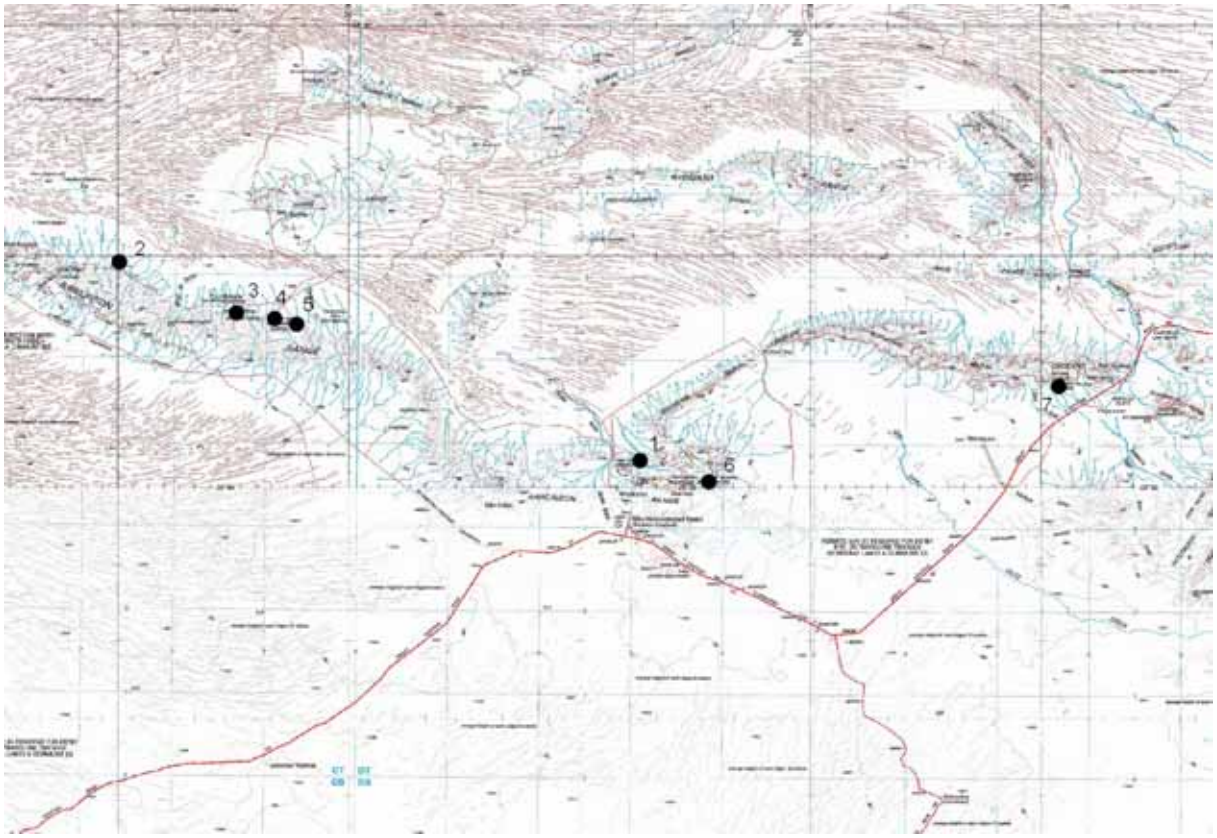

Figure 3. Justin Armstrong, Ernest Bennett, Neil Murray showing collecting nets used to sample butterflies at a waterhole near Fort McKellar with river red gum woodland.

Figure 4. Traditional Owner Ernest Bennett at campsite.