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MARBL Lithium Operations Pty Ltd
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Memo Report: Wodgina – Targeted Significant Fauna Survey

Introduction and Objectives

MARBL Lithium Operations Pty Ltd (MARBL) seeks to expand the Wodgina Lithium Project (the Project) located approximately 95 km south of Porth Hedland in the Pilbara region of Western Australia. The future development envelope encompasses an area of approximately 316.7 ha comprising a southern and northern area collectively referred to as the Survey Area. Previous fauna survey work and habitat mapping identified the Rocky Ridge and Gorge habitat (~27.6 ha) present in the Survey Area as having potential to support significant species.

Stantec Australia Pty Ltd (Stantec) was appointed by MARBL to undertake a targeted significant fauna survey within Rocky Ridge and Gorge habitat to inform an impact assessment for the Project. The following significant species were recorded in the Survey Area in 2018 and were targeted during this survey to obtain a current understanding of utilisation:

- Northern Quoll (*Dasyurus hallucatus*, EN; EN);
- Ghost Bat (*Macroderma gigas*, VU; VU);
- Pilbara Leaf-nosed Bat (*Rhinonicteris aurantius* Pilbara form; PLNB, VU; VU);
- Western Pebble-mound Mouse (*Pseudomys chapmani*, P4).

The overarching objective of this work was to determine the presence of significant fauna within the Rocky Ridge and Gorge habitat of the Survey Area. Specifically, this involved the deployment of baited motion cameras to detect the presence of Northern Quolls and echolocation recording units to detect the presence of the Ghost Bat and PLNB. The Western Pebble-mound Mouse was be detected opportunistically when traversing the Survey Area by recording the species conspicuous mounds. The objectives and methods used in the survey were aligned with the following guidelines:

- Technical Guidance: Terrestrial Fauna Surveys for Environmental Impact Assessment (EPA, 2020);
- Environmental Factor Guideline – Terrestrial Fauna (EPA, 2016);
- EPBC Act Referral Guideline for the Endangered Northern Quoll (DotE, 2016);
- Survey Guidelines for Australia's Threatened Mammals (DSEWPaC, 2011);
- Survey Guidelines for Australia's Threatened Bats (DEWHA, 2010).

Methodology

The targeted significant fauna survey was conducted from the 5th to the 6th of April 2022. Field work was conducted by experienced Stantec ecologist Jasmine Wynen-Gaugg with assistance from MARBL Environmental Advisor Alysha Abbott. Jasmine has experience undertaking surveys for Northern Quoll and significant bat species in the Pilbara region. All units were retrieved on the 13th of April 2022 by MARBL personnel.

The targeted search area comprised the Rocky Ridge and Gorge habitat which was identified during a previous habitat mapping and consolidation exercise of the Survey Area (Stantec, 2018a) (Figure 1). The following works were undertaken:

- ten motion cameras and six echolocation units were deployed for a minimum of seven nights at locations most likely to be used by the target species;
- motion cameras were baited with universal bait (peanut butter, oats, sardines);

- a microhabitat assessment was performed for all caves in which echolocation recorders were deployed;
- any signs of significant species (e.g., scats, pebble mounds) observed while traveling through the Survey Area were recorded.

While units were deployed to achieve appropriate geographical coverage of the search area, it was not possible to survey all areas of suitable habitat within the Survey Area. Primarily this was due to time constrains and the steep nature of the terrain. For example, field personnel were unable to deploy echolocation units in caves which had previously recorded bat calls (Stantec, 2018b) due to safety considerations. However, although not all areas of the Survey Area could be accessed, the coverage was considered sufficient to inform the utilisation of the Survey Area by significant species. For example, Northern Quolls would have been attracted to the baited cameras from surrounding suitable habitats and both bat species visit a number of caves in an area when foraging. Echolocation recordings were analysed by bat specialist Robert Bullen of Bat Call WA. Motion Cameras were analysed internally by a Stantec zoologist.

Results and conclusions

Northern Quoll

Northern Quoll were detected on six separate instances across four of the 10 motion cameras (Table 1;Figure 2). It is difficult to determine the number of individuals this represents as spot patterns were not clearly visible in most photos. It is likely there are at least two individuals given that the REC45 site is separated from the other motion camera sites by a large patch of disturbed area (Figure 1). Guidelines outlined by (DotE, 2016) state that Northern Quoll populations can be deemed high density (numerous camera triggers of multiple individuals) or low density (infrequent camera triggers of one to two individuals). The survey detection rate was six Northern Quoll per 72 trap nights (8.3%), suggesting the Northern Quoll population in the Survey Area is likely low density.

The Rocky Ridge and Gorge habitat contains many alcoves and outcrops which provide suitable habitat for Northern Quoll (Stantec, 2018a). Previous targeted Northern Quoll surveys in and adjacent to the Survey Area indicate that the species was locally abundant but declined in 2015, possibly due to a large-scale fire (A. Stantec, 2017). The most recent basic fauna survey by Stantec (2018a), recorded Northern Quoll scat at 13 locations and recorded individuals on motion cameras at six locations. Similarly, Northern Quoll were recorded on 24 occasions (two motion camera and 22 scat records) across both of 360 Environmental's 2018 surveys (2018a, 2018b). There was a similar number of camera detections across the present survey and the 2018 surveys, suggesting the Northern Quoll population may be recovering post-fire. No scats were detected during the current survey, however this is difficult to compare as searches were limited by access and available time.

Table 1: Northern Quoll detections on motion cameras deployed during the survey.

Site	Trap night (Date)							
	Night 1 (Apr 5)	Night 2 (Apr 6)	Night 3 (Apr 7)	Night 4 (Apr 8)	Night 5 (Apr 9)	Night 6 (Apr 10)	Night 7 (Apr 11)	Night 8 (Apr 12)
REC06	-	×	×	×	×	×	×	×
REC10	-	×	×	×	×	×	×	×
REC23	-	×	×	×	×	×	×	×
REC26	×	×	×	×	×	×	×	×
REC32	-	×	×	×	×	✓	×	✓ (twice)
REC37	×	×	✓	×	×	×	×	×
REC41	-	×	×	×	×	×	×	✓
REC42	-	×	×	×	×	×	×	×
REC44	-	×	×	×	×	×	×	×
REC45	-	✓	×	×	×	×	✓	×

Ghost Bat and Pilbara Leaf-nosed Bat

Ghost Bats and PLNB were recorded in low numbers at one and two sites respectively (Table 2; Figure 2). Calls were infrequent and the timing was consistent with foraging rather than roosting. No scats from either species were recorded during the survey.

All caves assessed during this survey were either shallow, medium to small caves, or large overhangs which are not optimal for roosting (Armstrong & Anstee, 2000; Bat Call, 2021a, 2021b);Table 3). PLNB have strict microclimate requirements for diurnal roosting but may use smaller caves for resting or feeding while foraging at night (Armstrong, 2001). Similarly, Ghost Bats may use shallow caves opportunistically to rest or take refuge while foraging, however this is not considered critical habitat (Bat Call, 2021a). The microhabitat assessments were supported by the echolocation recordings which indicated the sites were either not visited by these species or were used infrequently while foraging in low numbers. Additionally, these results align with a previous survey of the Rocky Ridge and Gorge habitat which also failed to identify suitable roosting habitat and only recorded Ghost Bats and PLNB foraging in low numbers (Stantec, 2018b).

Table 2: PLNB and Ghost bat calls.

Site	Unit	Dates of recording	Pilbara Leaf-nosed Bat	Ghost Bat
WOG-CA-04	Bat02	6-12 April	No calls	No calls
WOG-CA-02	Bat03	5-12 April	April 7: 4 calls at 04:42	April 6: 2 calls at 19:21
WOG-CA-05	Bat22	6-12 April	April 7: 1 call at 04:42 April 10: 1 call at 21:45	No calls
WOG-CA-03	Bat24	6-12 April	No calls	No calls
WOG-OH-01	Bat27	6-12 April	No calls	No calls
WOG-CA-01	Bat28	5-12 April	No calls	No calls

Other significant fauna

No Western Pebble-mound Mouse mounds were observed during fieldwork and no mice were recorded on the motion cameras. This is likely because the species requires stony plain habitat containing pebbles of the appropriate size to construct their mounds. While there are many Western Pebble-mound Mouse records in and surrounding the Survey Area, most occur in Spinifex Stony Plain habitat and very few exist on the margins of Rocky Ridge and Gorge habitat (Stantec, 2018a). No other significant fauna was recorded during the survey.

Limitations

The Rocky Ridge and Gorge habitat was difficult to traverse due to its steep and rocky nature. Field personnel deemed some areas unsafe to access and instead placed echolocation units on the boundary of Rocky Ridge and Gorge, and Rocky Foothill habitat. This is not believed to have affected survey results as many previous Ghost Bat, Northern Quoll and PLNB records are from this transitional zone. Additionally, previous surveys have not identified any permanent diurnal roosts for either species in the Survey Area, and they are not expected to occur (Stantec, 2017, 2018a). Due to time constraints, no additional targeted searches for secondary signs (scats, mounds, tracks) were conducted during the survey.

Yours sincerely,

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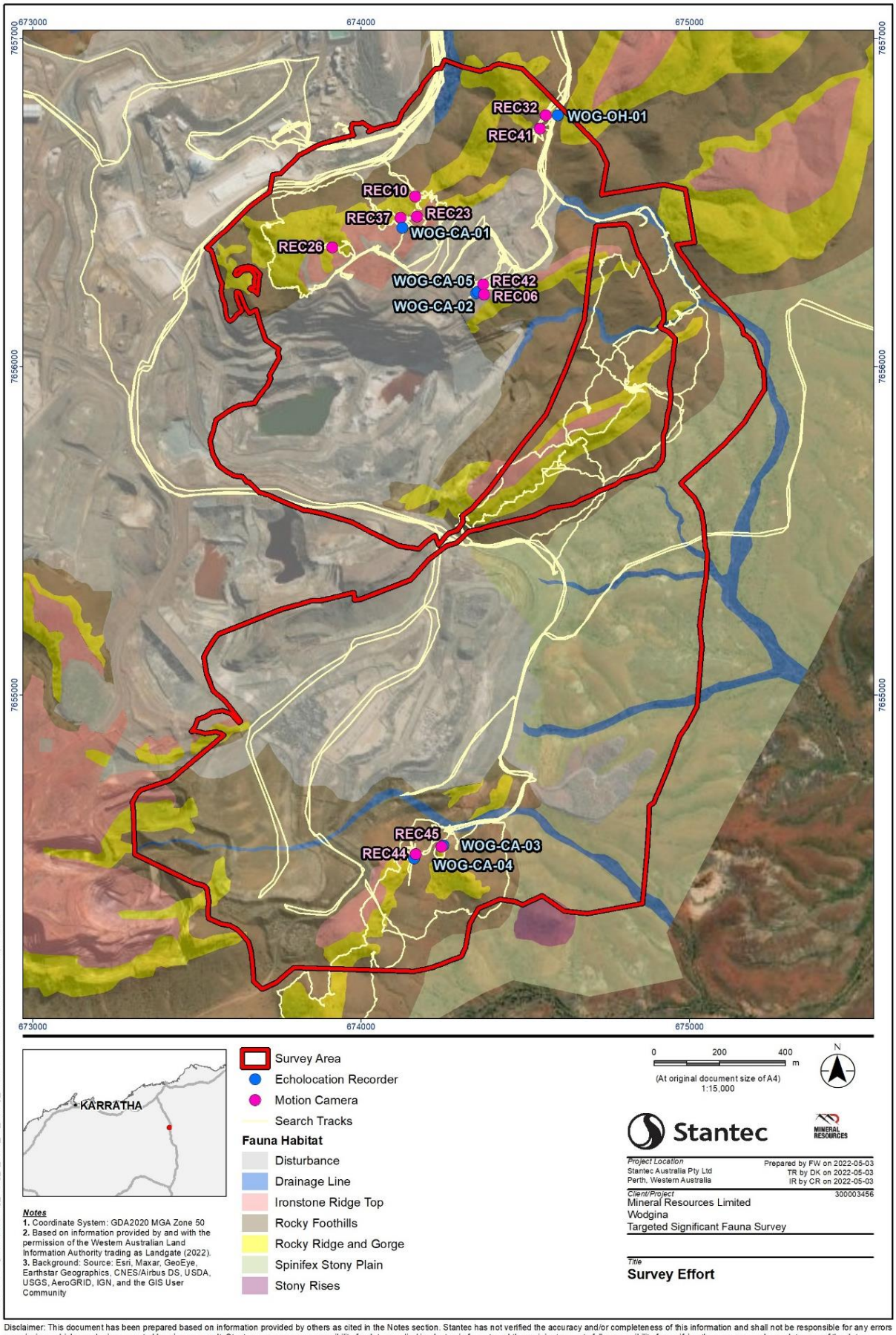


Figure 1: Survey effort and locations of echolocation units and motion camera sites within the Survey Area.

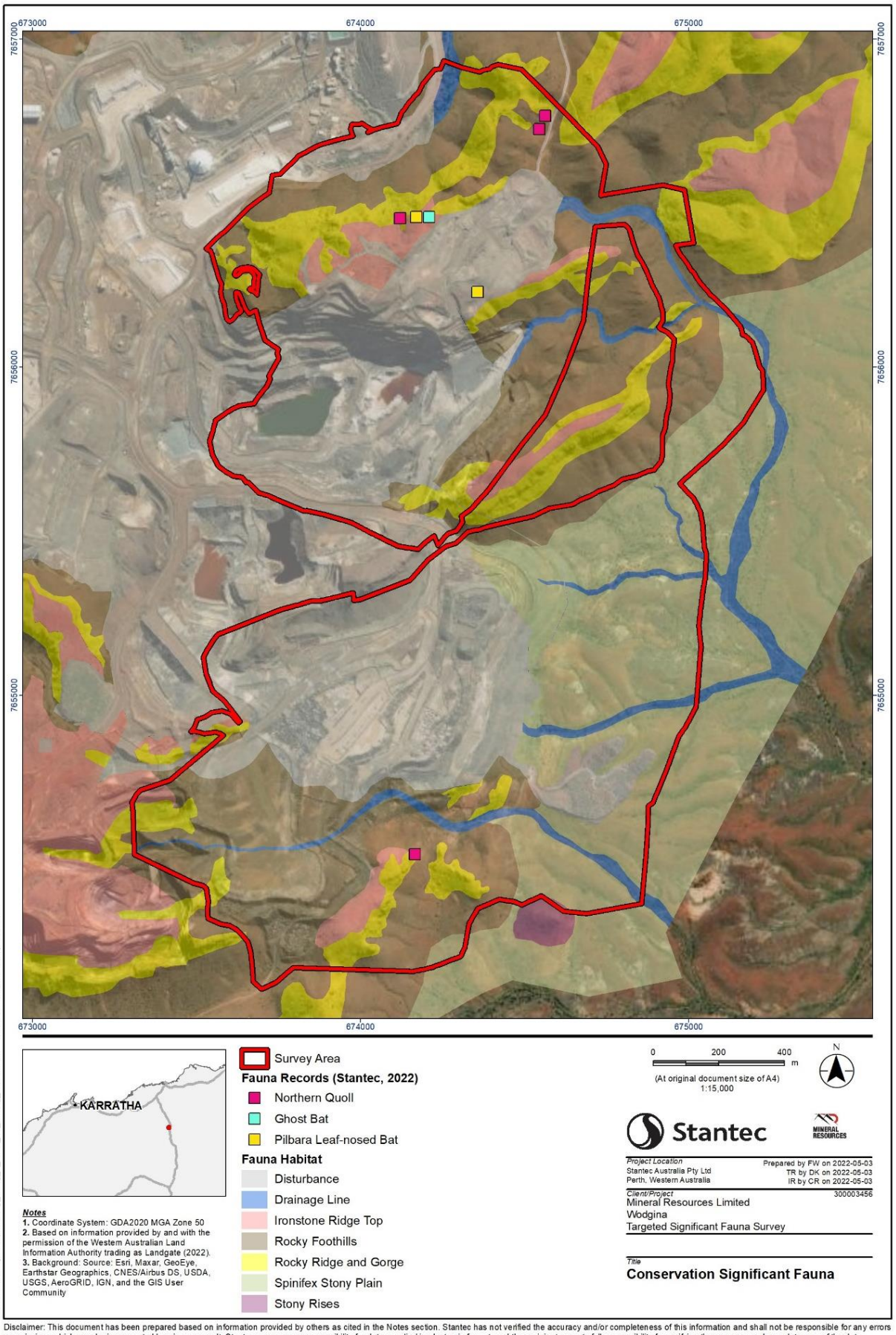
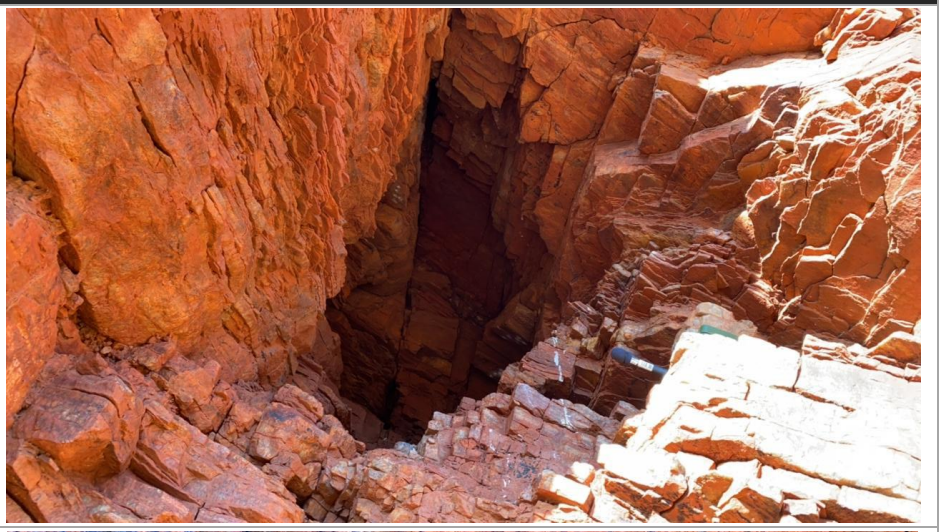


Figure 2: Locations of significant fauna recorded in the Survey Area.

Table 3: Cave and overhang microhabitat assessments.

Site	Description and notes	Reference photograph
WOG-CA-01	Small, shallow cave.	
WOG-CA-02	Large, shallow cave.	
WOG-CA-03	Small, shallow cave with small entrance.	

Site	Description and notes	Reference photograph
WOG-CA-04	Medium shallow cave.	
WOG-CA-05	Medium, shallow cave.	
WOG-OH-01	Medium overhang.	

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