



Roy Hill Mine and Southern Borefields Targeted Fauna Survey

Biologic Environmental Survey

Report to Roy Hill Iron Ore

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EXECUTIVE SUMMARY

Roy Hill Iron Ore (Roy Hill) commissioned Biologic Environmental Survey (Biologic) to undertake a targeted greater bilby (*Macrotis lagotis*) and northern quoll (*Dasyurus hallucatus*) survey for the Roy Hill Mine Area and Southern Borefields Area (hereafter referred to as the Mine Study Area and Borefields Study Area respectively, or Study Areas collectively). The Roy Hill Mine is located approximately 110 kilometres (km) north of Newman in the Pilbara region of Western Australia.

This survey follows the results of a Level 1 vertebrate fauna assessment conducted by Biologic (2018) and subsequent monitoring activities of greater bilby previously recorded within the Mine Study Area. The overarching purpose of this assessment was to fill knowledge gaps regarding the presence of target species, specifically to clarify the likelihood of occurrence and determine the spatial and quantitative extent of occurrence of the greater bilby and northern quoll within the Study Areas.

The targeted survey was conducted over three field trips from 3–6 December 2019, 4–8 February 2020 and 17–20 February 2020. The methodology was specific to recording the presence of the targeted species, comprising of motion camera transects to detect northern quoll and 2-hectare (ha) search plots and transects to detect signs of greater bilby.

Greater Bilby

Greater bilby has previously been recorded 52 times within the Study Areas, 38 times within the Mine Study Area and a further 14 times from within the Southern Borefields Area. Recent evidence of occurrence and presence of an individual was confirmed near the Roy Hill Mine Gatehouse, within the Mine Study Area, in July 2018. This individual was subject to subsequent monitoring; however, was killed by a vehicle collision in September 2019. No evidence of greater bilby occurrence within the Study Areas was recorded during the current survey. However, as the species is highly cryptic and regularly not easily observed, in addition to its high dispersal capabilities and often sparse distribution across arid landscapes, the species may still occur. The previous occurrence of greater bilby within the Mine Study Area may represent a dispersing individual from other areas outside the Study Areas. The lack of recent observations of the species within the Study Area does not necessitate that greater bilbies will not use the habitats occurring within the Study Area in the future or have not used it in the past.

Northern quoll

There are no previous records of northern quoll within the Mine Study Area; however, the species has previously been recorded on three occasions from secondary evidence (scats) within approximately 2 km to the north of the Study Area. The current survey recorded no evidence of northern quoll occurrence within the Mine Study Area, from either direct observation or secondary evidence. Based on the work undertaken thus far and the density of records within the vicinity of the Mine Study Area, it is likely that northern quoll occurrence within the Study Area will be infrequent, occurring only a transitory individuals dispersing from a permanent population elsewhere, and/or during periods of regional population highs. Due to the low to moderate suitability of habitat within the Study Area, the occurrence of a residing population occurring, or establishing, within the Mine Study Area is unlikely.

1 INTRODUCTION

1.1 Background

Roy Hill Iron Ore (Roy Hill) commissioned Biologic Environmental Survey (Biologic) to undertake a targeted greater bilby (*Macrotis lagotis*) and northern quoll (*Dasyurus hallucatus*) survey for the Roy Hill Mine Area and Southern Borefields Area (hereafter referred to as the Mine Study Area and Borefields Study Area respectively, collectively as the Study Areas), located approximately 110 kilometres (km) north of Newman (Figure 1.1).

The Mine Study Area comprises mining tenements M46/518 and M46/519, which cover an area of approximately 27,651 hectares (ha) and encompass current operations for the Roy Hill Mine (Figure 1.1). The Borefields Study Area comprises all areas previously mapped as Spinifex Sandplain habitat by Biologic (2018) within Roy Hill granted tenure to the south of the Mine Area and covers approximately 10,010 ha (Figure 1.1).

Two conservation significant species listed under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) have previously been recorded within or in the vicinity of the Study Areas, northern quoll (Endangered) and greater bilby (Vulnerable) (Figure 1.1). Greater bilby has been recorded from active burrows within Mulga Woodland habitat in the south-western section of the Mine Study Area in 2018 (Biologic, 2018). DNA analysis of scats collected near the active burrow during subsequent monitoring indicated that a single individual was utilising the area (Dziminski & Carpenter, 2019). Northern quoll has previously been recorded from secondary evidence (scats) in Rocky Hills habitat directly north of the Mine Study Area in 2013 (DBCA, 2020) and 2017 (Biologic, 2018). Biologic (2018) indicated the species was likely to occur in the Mine Study Area in low densities where suitable Rocky Hills habitat occurs; however, additional survey effort was required to determine the species' extent of occurrence.

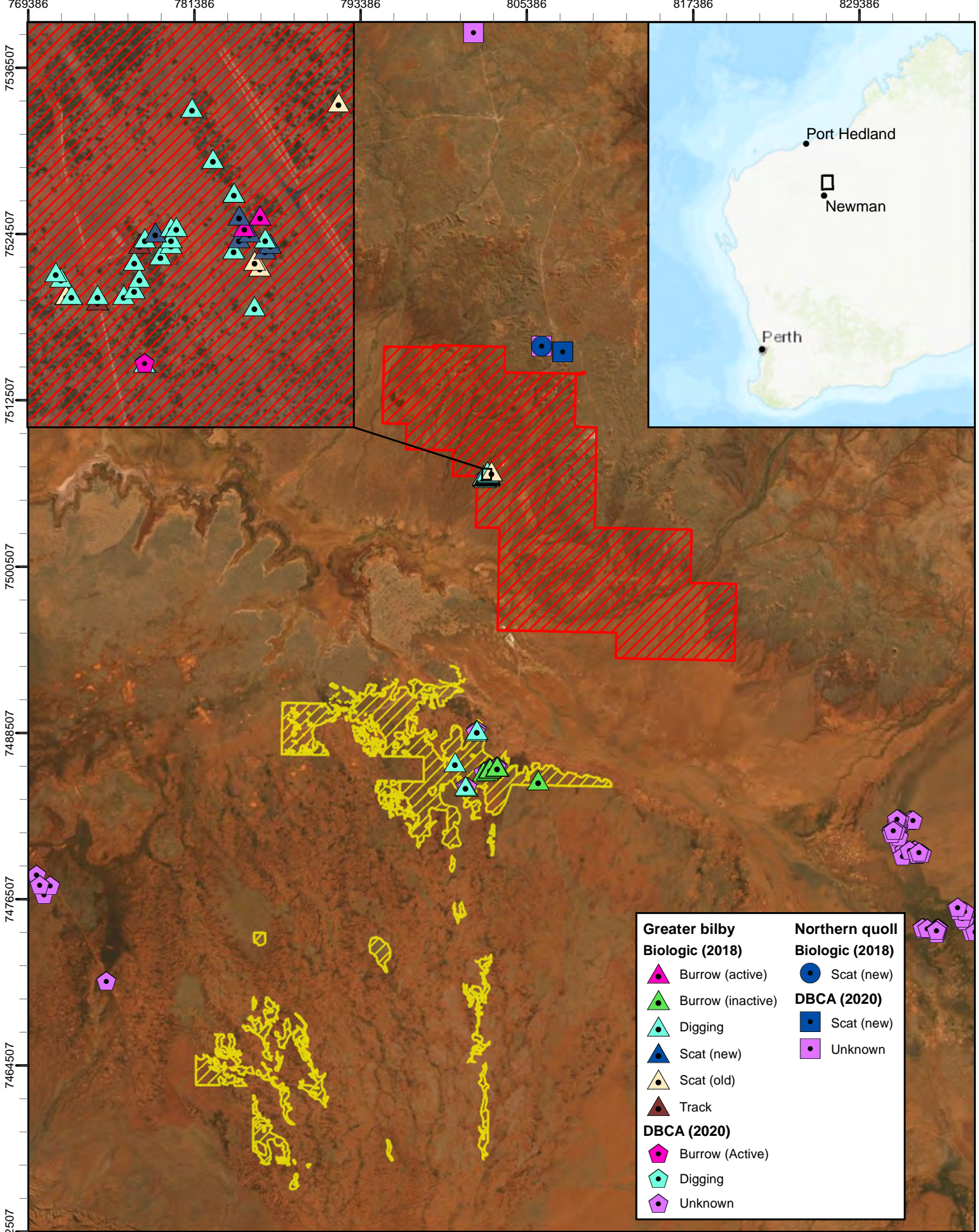
Broad fauna habitat mapping undertaken for the extent of the Study Areas has indicated habitats similar to that which greater bilby and northern quoll have previously been recorded more broadly within the Study Areas (Biologic, 2018). To inform future management for both species within the Study Areas, Roy Hill committed to undertaking a targeted fauna survey to assess the occurrence and extent of both species within the Study Areas.

1.2 Objectives

The overarching purpose of this assessment was to determine the occurrence and extent of greater bilby and northern quoll within the Study Areas, to inform appropriate environmental management in relation to current and future operations within the Study Areas. Specifically, the key objectives of the assessment were to:

- conduct a targeted survey for greater bilby within the Mulga Woodland and other suitable habitat to determine presence within the Mine Study Area;


- conduct a targeted survey for greater bilby within Spinifex Sandplain habitat within the Southern Borefields Study Area; and
- conduct a targeted survey for northern quoll within appropriate habitat within the Mine Study Area to determine if there is a resident northern quoll population or if previous scat records are more likely to be attributed to an individual traversing the area.



Legend

Study Areas

- Mine
- Southern Borefields



1:350,000

0 2.5 5 10 km

Roy Hill Holdings Pty Ltd
Targeted Fauna Survey

Fig. 1.1: Study Area and location of previous greater bilby and northern quoll records

Coordinate System: GDA 1994 MGA Zone 50
 Projection: Transverse Mercator
 Datum: GDA 1994 Size A4. Created 06/03/2020

Greater bilby	Northern quoll
Biologic (2018)	Biologic (2018)
Burrow (active)	Scat (new)
Burrow (inactive)	DBCA (2020)
Digging	Scat (new)
Scat (new)	Unknown
Scat (old)	
Track	
DBCA (2020)	
Burrow (Active)	
Digging	
Unknown	

2 SPECIES OF CONSERVATION SIGNIFICANCE

2.1 Greater Bilby (*Macrotis lagotis*)

The greater bilby is listed as Vulnerable under the EPBC Act and *Biodiversity Conservation Act 2016* (BC Act). Greater bilbies are semi-fossorial and nocturnal, remaining in their burrows during the day and intermittently during the night for rest and refuge. Greater bilby populations naturally occur as scattered solitary individuals or small groups (Smythe & Philpott, 1968; Southgate, 1990a). They are recorded as having low site fidelity and high mobility (Southgate *et al.*, 2007); males regularly move three to five kilometres between burrows on consecutive days; and have been recorded moving up to 15 km in a few weeks (Southgate & Possingham, 1995). This high mobility, together with low population density, ensures that the area of occupancy is often far less than the extent of occurrence. As greater bilbies are solitary in nature, lack territoriality and have large home ranges, it is likely that males adopt a roving strategy to find receptive females; consistent with an overlapping promiscuous mating system (Miller *et al.*, 2010).

Greater bilbies occupy three major vegetation types across their distribution; open tussock grassland, mulga woodland/shrublands and hummock grassland in plains and alluvial areas (Woinarski *et al.*, 2014). Laterite and rock feature substrates are an important part of greater bilby habitat as they support shrub species, such as *Acacia kempeana*, *A. hilliana* and *A. rhodophylla*, which have root-dwelling larvae (Southgate *et al.*, 2007) that provide a constant food source. These habitats also contain spinifex hummocks, which are quite uniform and discrete, providing runways between hummocks and enabling easier movement and foraging (Southgate *et al.*, 2007). Minimal ground cover is a common feature in greater bilby habitats, as it allows easy foraging. Habitat within the Pilbara bioregion seems to consist mostly of spinifex sand plain associated with major drainage line sandy terraces. In general, the distribution of greater bilbies can be limited by the availability of suitable burrowing habitat, such as dunes where burrow excavation is easier (Moseby & O'Donnell, 2003), and are not found in predominantly rocky areas or mountains, where they would be unable to dig suitable burrow systems or dig for food.

2.2 Northern Quoll (*Dasyurus hallucatus*)

The northern quoll is listed as Endangered under the EPBC Act and the BC Act. The species was once widely distributed across northern Australia, although is now restricted to four isolated populations; the Pilbara, the Kimberley and Northern Territory, and Queensland (DoE, 2016). At present northern quolls are relatively common in the northern Pilbara region but are much less common in southern and south-eastern parts of the region (Cramer *et al.*, 2016).

The northern quoll inhabits ironstone and sandstone ridges, scree slopes, granite boulders and outcrops, drainage lines, riverine habitats (Braithwaite & Griffiths, 1994; Oakwood, 2002), dissected rocky escarpments, open forest of lowland savannah and woodland (Oakwood, 2002, 2008). Rocky habitats tend to support higher densities, as they offer protection from predators and are generally more productive in terms of availability of resources (Braithwaite & Griffiths, 1994; Oakwood, 2000). Other microhabitat features important to the species include rock cover; proximity to permanent water, and

time-since last fire (Woinarski *et al.*, 2008). Dens occur in a wide range of situations including rock overhangs, tree hollows, hollow logs, termite mounds, goanna burrows and human dwellings/infrastructure, where individuals usually den alone (Oakwood, 2002; Woinarski *et al.*, 2008). Abundance is thought to be lowest toward the end of winter into early spring, after the mating season, as a significant proportion of adult males die off and young have not yet begun to forage independently (Braithwaite & Griffiths, 1994; Oakwood, 2000). Home ranges in the western Pilbara range between 75–443 ha for females and 5–1,109 ha for males (King, 1989).

3 METHODOLOGY

3.1 Compliance

This assessment was carried out in a manner consistent with the following documents developed by the Western Australian Environmental Protection Authority (EPA), the Department of Biodiversity, Conservation and Attractions (DBCA) and the Department of Agriculture, Water and the Environment (DAWE – formerly the Department of the Environment [DoE] and the Department of Sustainability, Water, Population, and Communities [DSEWPaC]):

- EPA (2016) Technical guidance: Sampling methods for terrestrial vertebrate fauna;
- EPA (2016) Technical guidance: Terrestrial fauna surveys;
- DSEWPaC (2011) Survey Guidelines for Australia’s Threatened Mammals;
- DBCA (2017) Guidelines for surveys to detect the presence of bilbies and access the importance of habitat in Western Australia; and
- DoE (2016) EPBC Act referral guideline for the endangered northern quoll (*Dasyurus hallucatus*).

3.2 Field Survey

3.2.1 Survey Timing and Weather

The assessment was undertaken over three field surveys; the first from 3rd to the 5th December 2019, to deploy motion cameras in prospective northern quoll habitat within the Mine Study Area; the second from the 4th to 9th February 2020, to retrieve motion cameras and undertake targeted greater bilby searches within both Study Areas; and the third from 17th to the 20th February, to undertake targeted greater bilby searches within both Study Areas.

Observed weather conditions in the 12 months prior to and between field surveys during motion camera deployment are shown in Figure 3.1, with long-term climatic data for Newman Airport (weather station number 007176). During 6 months prior to the assessment, rainfall was below average in comparison to the long-term average. Two cyclones occurred during the survey period in early January and February 2020, the former resulting in 142 mm of rainfall recorded at Newman Airport on the 9 January and the latter in 45 mm rainfall on the 10 February. Rainfall during January was considerably higher than the long-term average. Observed minimum and maximum monthly temperatures were consistent with the long-term annual average temperatures for the same period (Figure 3.1) (BoM, 2020).

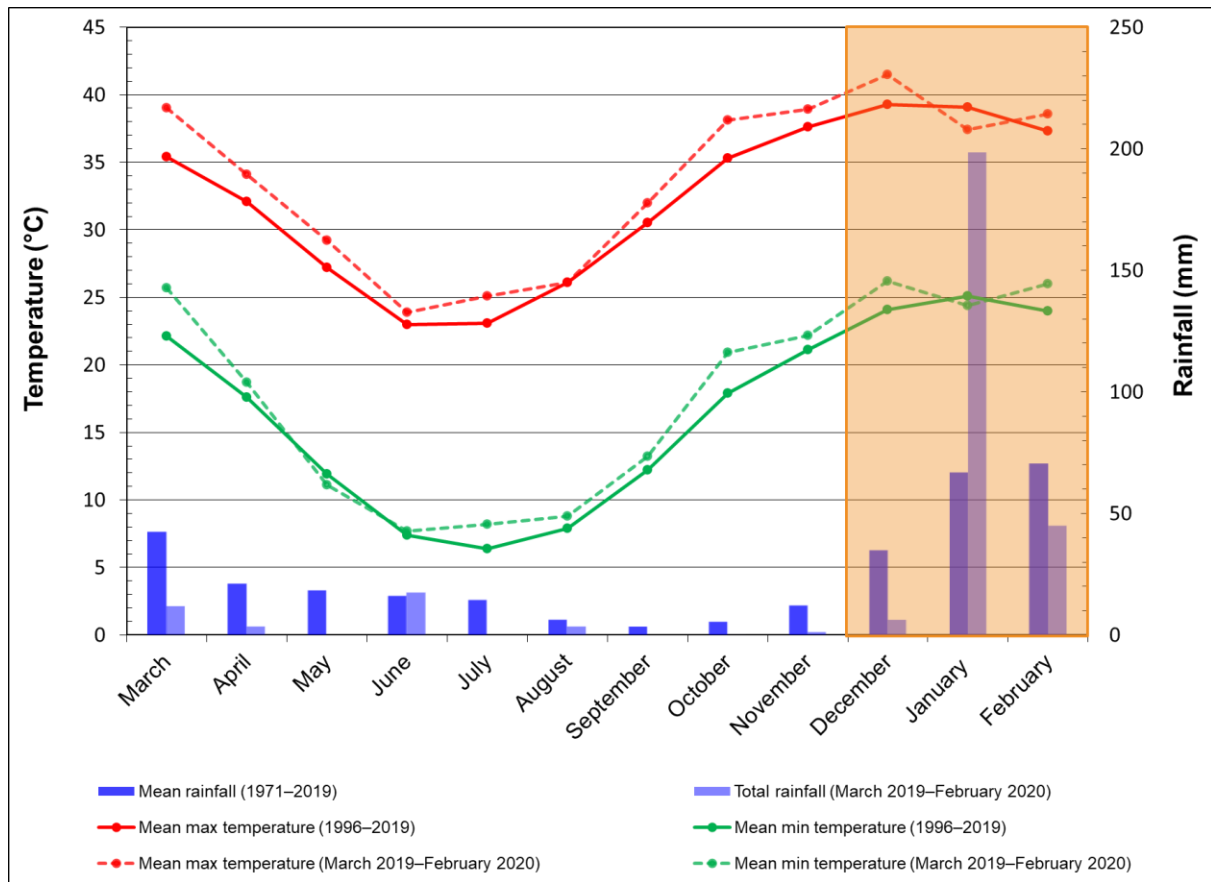


Figure 3.1: Long-term and current climatic data for Newman Airport (BoM, 2020) with approximate sampling shown in shaded box.

3.2.2 Survey Team and Licensing

The surveys were conducted by Ray Lloyd, Phillip Runham, Ashleigh Jenkins and Courtney Proctor, whom collectively have over 30 years’ experience conducting fauna surveys of this nature within the Pilbara region (Table 3.1). The survey was conducted under DBCA Regulation 17 license (Fauna Taking (Biological Assessment) License) BA27000153-2 issued to C, Knuckey.

Table 3.1 Survey timing and personnel

Trip	Team	Survey Timing	Personnel
1	1	3/12/2019–5/12/2019	Phil Runham, Ashleigh Jenkins
2	1	4/02/2019–8/02/2020	Phil Runham, Ashleigh Jenkins
	2	4/02/2019–8/02/2020	Ray Lloyd, Courtney Proctor
3	1	17/02/2020–20/02/2020	Phil Runham, Ashleigh Jenkins

3.2.3 Greater Bilby Sampling

Targeted sampling for evidence of greater bilby occurrence was undertaken in habitat most likely to support the species, within each Study Area. Targeted sampling comprised 2 hectare survey plots and walked transects which were completed in accordance with survey guidelines for the species (DBCA, 2017) (Table 3.2; Figure 3.2; Figure 3.3).

Two Hectare Survey Plots

Two hectare survey plots (hereafter referred to as survey plot) were distributed across the Study Areas to sample within all habitat types suitable for greater bilby and where possible, include representatives of all habitat conditions currently occurring at the time of the field survey (i.e. different stages of post fire regrowth). Within the Mine Study Area, survey plots focused primarily on Mulga Woodland habitat, particularly where suitable burrowing substrate was present (Figure 3.2; Figure 3.3). Within the Borefields Study Area, sampling was focused on Spinifex Sandplain habitat, which is considered optimal habitat for the species (Figure 3.2; Figure 3.3).

Searches for evidence of greater bilby were undertaken within each survey plot for a minimum of 25 minutes and comprised searches for secondary evidence for the species (i.e. burrows, diggings, tracks and scats), as described by Southgate *et al.* (2019). Where plant species could be identified by field personnel during searches for foraging evidence, particular attention was paid to species known to contain root-dwelling larvae foraged on by greater bilby, as summarised by Southgate *et al.* (2019).

Overall, a total of 93 survey plots, totalling 38.75 person hours, were sampled for greater bilby across the Study Areas, comprising 17.9 hours within the 43 plots located in the Mine Study Area and 20.83 hours within the 50 plots in the Borefields Study Area.

Transect Searching

Due to the size of the Study Areas, survey plots were supplemented with additional targeted searches while traversing areas between sampling sites and/or in areas of suitable habitat (Table 3.2; Figure 3.2; Figure 3.3). A total of 5 transect searches were undertaken within the Mine Study Area over approximately 2.4 person hours and 18 within the Borefields Study Area over approximately 15.25 person hours (Table 3.2; Figure 3.2; Figure 3.3).

Table 3.2: Summary of targeted greater bilby sites and survey effort

Site	Study Area	Habitat Type	Latitude	Longitude	2 ha Plot Search (person minutes)	Transect Search (person hours)
VROY-07	Borefields	Spinifex Sandplain	-22.9513	119.7936	25	
VROY-09	Borefields	Spinifex Sandplain	-22.9112	119.7938	25	1
VROY-11	Borefields	Spinifex Sandplain	-22.9157	119.7783	25	0.5
VROY-13	Borefields	Spinifex Sandplain	-22.9105	119.7637	25	0.5
VROY-15	Borefields	Spinifex Sandplain	-22.8985	119.7700	25	1
VROY-17	Borefields	Spinifex Sandplain	-22.8792	119.7912	25	
VROY-19	Borefields	Spinifex Sandplain	-22.8620	119.7932	25	
VROY-21	Borefields	Spinifex Sandplain	-22.9676	119.8914	25	
VROY-23	Borefields	Spinifex Sandplain	-22.9205	119.8353	25	0.5
VROY-25	Borefields	Spinifex Sandplain	-22.9062	119.9456	25	
VROY-27	Borefields	Spinifex Sandplain	-22.9561	119.9465	25	0.75
VROY-29	Borefields	Spinifex Sandplain	-22.8234	119.8678	25	
VROY-31	Borefields	Spinifex Sandplain	-22.7554	119.9181	25	
VROY-33	Borefields	Spinifex Sandplain	-22.7477	119.9250	25	
VROY-35	Borefields	Spinifex Sandplain	-22.7189	119.9324	25	
VROY-37	Borefields	Spinifex Sandplain	-22.7136	119.9077	25	
VROY-39	Borefields	Spinifex Sandplain	-22.7327	119.8736	25	
VROY-41	Borefields	Spinifex Sandplain	-22.7209	119.8853	25	
VROY-43	Borefields	Spinifex Sandplain	-22.6984	119.8902	25	
VROY-45	Borefields	Spinifex Sandplain	-22.6810	119.8877	25	
VROY-47	Borefields	Spinifex Sandplain	-22.6679	119.8878	25	
VROY-49	Borefields	Spinifex Sandplain	-22.6577	119.8936	25	
VROY-51	Borefields	Spinifex Sandplain	-22.6565	119.9257	25	
VROY-56	Borefields	Spinifex Sandplain	-22.6815	119.8058	25	0.5
VROY-58	Borefields	Spinifex Sandplain	-22.6887	119.8052	25	1
VROY-60	Borefields	Spinifex Sandplain	-22.6856	119.8184	25	1

Site	Study Area	Habitat Type	Latitude	Longitude	2 ha Plot Search (person minutes)	Transect Search (person hours)
VROY-62	Borefields	Spinifex Sandplain	-22.6762	119.8330	25	1
VROY-64	Borefields	Spinifex Sandplain	-22.6748	119.8574	25	1
VROY-66	Borefields	Spinifex Sandplain	-22.6694	119.8582	25	1
VROY-68	Borefields	Spinifex Sandplain	-22.6588	119.8770	25	1
VROY-70	Borefields	Spinifex Sandplain	-22.6610	119.9104	25	
VROY-72	Borefields	Spinifex Sandplain	-22.7010	119.9224	25	
VROY-73	Borefields	Spinifex Sandplain	-22.7278	119.9366	25	
VROY-74	Borefields	Spinifex Sandplain	-22.7157	119.9409	25	
VROY-75	Borefields	Spinifex Sandplain	-22.7145	119.9787	25	
VROY-76	Borefields	Spinifex Sandplain	-22.7066	119.9751	25	
VROY-77	Borefields	Spinifex Sandplain	-22.7022	119.9372	25	
VROY-78	Borefields	Spinifex Sandplain	-22.8967	119.9368	25	1
VROY-79	Borefields	Spinifex Sandplain	-22.9008	119.9369	25	
VROY-80	Borefields	Spinifex Sandplain	-22.8485	119.8708	25	
VROY-81	Borefields	Spinifex Sandplain	-22.8764	119.7957	25	
VROY-82	Borefields	Spinifex Sandplain	-22.8438	119.8317	25	
VROY-83	Borefields	Spinifex Sandplain	-22.8105	119.9023	25	
VROY-84	Borefields	Spinifex Sandplain	-22.7862	119.8984	25	
VROY-85	Borefields	Spinifex Sandplain	-22.7376	119.9257	25	
VROY-86	Borefields	Spinifex Sandplain	-22.7137	119.9570	25	0.5
VROY-87	Borefields	Spinifex Sandplain	-22.7174	119.9589	25	
VROY-88	Borefields	Spinifex Sandplain	-22.7070	119.9884	25	1
VROY-89	Borefields	Spinifex Sandplain	-22.7095	119.9964	25	1
VROY-90	Borefields	Spinifex Sandplain	-22.7106	119.9890	25	1
VROY-05	Mine	Mulga Woodland	-22.5707	119.9745	25	
VROY-06	Mine	Mulga Woodland	-22.5149	119.9408	25	
VROY-08	Mine	Open Tussock Grassland	-22.6313	120.1001	25	

Site	Study Area	Habitat Type	Latitude	Longitude	2 ha Plot Search (person minutes)	Transect Search (person hours)
VROY-10	Mine	Mulga Woodland	-22.6127	120.0069	25	
VROY-12	Mine	Mulga Woodland	-22.6063	120.0971	25	0.3
VROY-14	Mine	Mulga Woodland	-22.5875	120.0909	25	
VROY-16	Mine	Mulga Woodland	-22.5944	120.0619	25	0.5
VROY-18	Mine	Open Tussock Grassland	-22.6300	120.0395	25	
VROY-20	Mine	Open Tussock Grassland	-22.6142	120.0289	25	0.6
VROY-22	Mine	Cleared Area	-22.5757	120.0130	25	
VROY-24	Mine	Mulga Drainage Line	-22.5724	120.0455	25	
VROY-26	Mine	Cleared Area	-22.5782	120.0837	25	
VROY-28	Mine	Mulga Woodland	-22.5625	120.0008	25	
VROY-30	Mine	Cleared Area	-22.4889	119.9103	25	
VROY-32	Mine	Mulga Woodland	-22.4755	119.9274	25	
VROY-34	Mine	Open Tussock Grassland	-22.4699	119.8706	25	
VROY-36	Mine	Mulga Drainage Line	-22.4507	119.8718	25	
VROY-38	Mine	Mulga Drainage Line	-22.4507	119.8720	25	
VROY-40	Mine	Spinifex Stony Plain	-22.4556	119.9483	25	
VROY-42	Mine	Cleared Area	-22.5002	119.9588	25	
VROY-44	Mine	Mulga Woodland	-22.5120	119.9635	25	
VROY-46	Mine	Mulga Woodland	-22.5293	119.9758	25	
VROY-48	Mine	Mulga Woodland	-22.5382	119.9601	25	
VROY-50	Mine	Cleared Area	-22.4732	119.9086	25	
VROY-52	Mine	Cleared Area	-22.4883	119.9398	25	
VROY-53	Mine	Open Tussock Grassland	-22.5965	119.9704	25	
VROY-54	Mine	Mulga Woodland	-22.5045	119.9361	25	
VROY-55	Mine	Mulga Woodland	-22.5926	119.9771	25	
VROY-57	Mine	Mulga Woodland	-22.5795	119.9882	25	0.5
VROY-59	Mine	Mulga Woodland	-22.5627	119.9869	25	

Site	Study Area	Habitat Type	Latitude	Longitude	2 ha Plot Search (person minutes)	Transect Search (person hours)
VROY-61	Mine	Mulga Woodland	-22.5886	119.9552	25	
VROY-63	Mine	Eucalypt Woodland	-22.5738	119.9605	25	0.5
VROY-65	Mine	Mulga Woodland	-22.5639	119.9528	25	
VROY-67	Mine	Mulga Woodland	-22.5483	119.9359	25	
VROY-69	Mine	Mulga Woodland	-22.5299	119.9363	25	
VROY-71	Mine	Mulga Drainage Line	-22.5157	119.9338	25	
VROY-91	Mine	Mulga Woodland	-22.4946	119.8843	25	
VROY-92	Mine	Mulga Woodland	-22.4974	119.9149	25	
VROY-93	Mine	Mulga Woodland	-22.5300	119.9488	25	
VROY-94	Mine	Mulga Woodland	-22.5541	119.9633	25	
VROY-95	Mine	Open Tussock Grassland	-22.6254	120.0727	25	
VROY-96	Mine	Open Tussock Grassland	-22.6106	120.0536	25	
VROY-97	Mine	Major Drainage Line	-22.6062	119.9675	25	
Total					38.75 hrs	17.65 hrs

3.2.4 Northern Quoll Sampling

Targeted sampling for northern quoll within the Mine Study Area was undertaken within areas of suitable habitat likely to support the species (Low Rocky Hills and Major Drainage Lines) (Table 3.2; Figure 3.2). Targeted sampling for northern quoll comprised motion camera transects and targeted searches in accordance with survey guidelines for the species (DoE, 2016). Targeted sampling for northern quoll focused only on the Mine Study Area, no targeted sampling was undertaken within the Borefields Study Area.

Motion Camera Transects

A total of four targeted northern quoll motion camera transects were deployed during the initial survey, all of which were retrieved during the second field survey (Table 3.2; Figure 3.2).

Each transect comprised ten motion cameras placed approximately 50–100 metres (m) apart along a transect within suitable denning and/or foraging/dispersal habitats habitat. Camera traps were baited with a universal bait mix (a mixture of peanut butter, oats and sardines). Each trap was set to record 5 seconds of video footage when triggered, continuously during their deployment.

Overall, a total of four motion camera transects were deployed within the Study Area. Cameras were deployed for between 62–63 consecutive nights, resulting in a total of 2,500 motion camera nights across the Mine Study Area (Table 3.2) – note that for a large portion of this time, cameras would not have expected to be baited due to the bait decomposing or having been consumed by animals prior to being collected. To accommodate this, where possible, motion cameras were positioned in areas most likely to record the species presence in the absence of bait (i.e. along likely movement corridors or in the vicinity of potential denning sites).

Targeted Searches

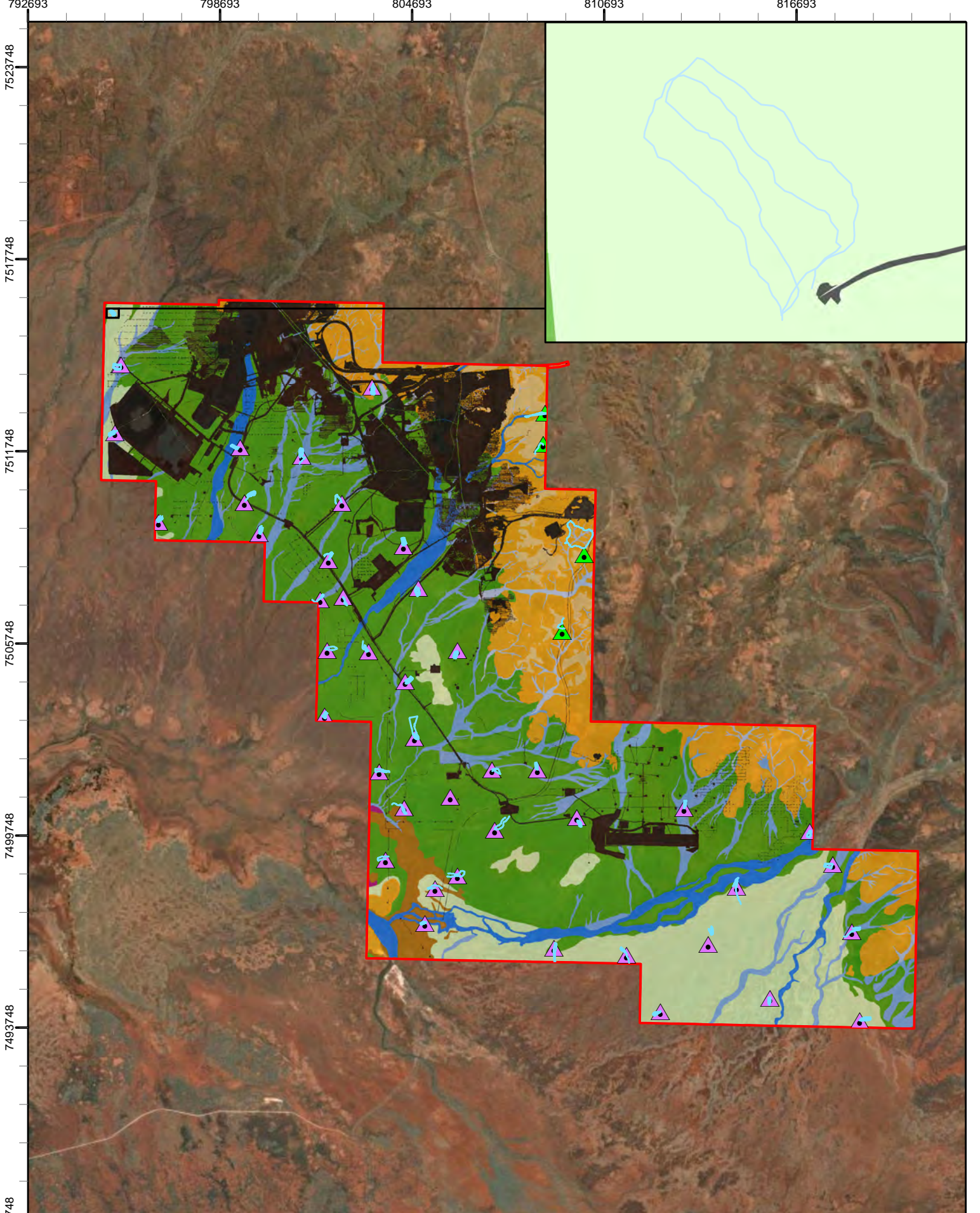
Targeted searches for northern quoll were undertaken in areas of suitable habitat within the Mine Study Area, including sites where motion camera transects were deployed (Table 3.2; Figure 3.2). Targeted searches comprised searching for any evidence of species occurrence, including direct observation and/or secondary evidence such as tracks, scats, foraging evidence and/or remains. Targeted searches were undertaken on multiple occasions at motion camera transect sites, including during motion camera deployment and retrieval. Collectively, targeted searches consisted of between 6–8 person hours per site, resulting in a total of 24 person hours for the survey.

3.2.5 Opportunistic Records

At all times while surveying, all records pertaining to species of conservation significance were documented. These records include those from primary (i.e. direct observation of species) or secondary (e.g. burrows, tracks, diggings and scats) evidence.

Table 3.3: Summary of targeted northern quoll sites and survey effort

Site	Study Area	Latitude	Longitude	Habitat Type	Motion Camera Transect				Targeted Searches (person hours)
					Deployed	Retrieved	Number of Cameras	Total Camera Nights	
VROY-01	Mine	-22.4620	120.0008	Major Drainage Line	4/12/2019	05/02/2020	10	630	6
VROY-02	Mine	-22.5233	120.0073	Low Rocky Hills	4/12/2019	05/02/2020	10	630	8
VROY-03	Mine	-22.4706	120.0004	Low Rocky Hills	5/12/2019	05/02/2020	10	620	6
VROY-04	Mine	-22.5016	120.0135	Low Rocky Hills	5/12/2019	05/02/2020	10	620	6
Total							40	2500	24



792693
7523748
7517748
7511748
7505748
7499748
7493748
748748

810693
816693

Legend

- Mine
- Tracks

Sampling site

- ▲ Greater bilby (survey plot)
- ▲ Northern quoll (motion camera)

Biologic (2018) fauna habitat mapping

- Chenopod Shrubland
- Cleared Area
- Eucalypt Woodland
- Low Rocky Hills
- Major Drainage Line
- Minor Drainage Line
- Mulga Drainage Line
- Mulga Woodland
- Open Tussock Grassland
- Spinifex Stonyplain

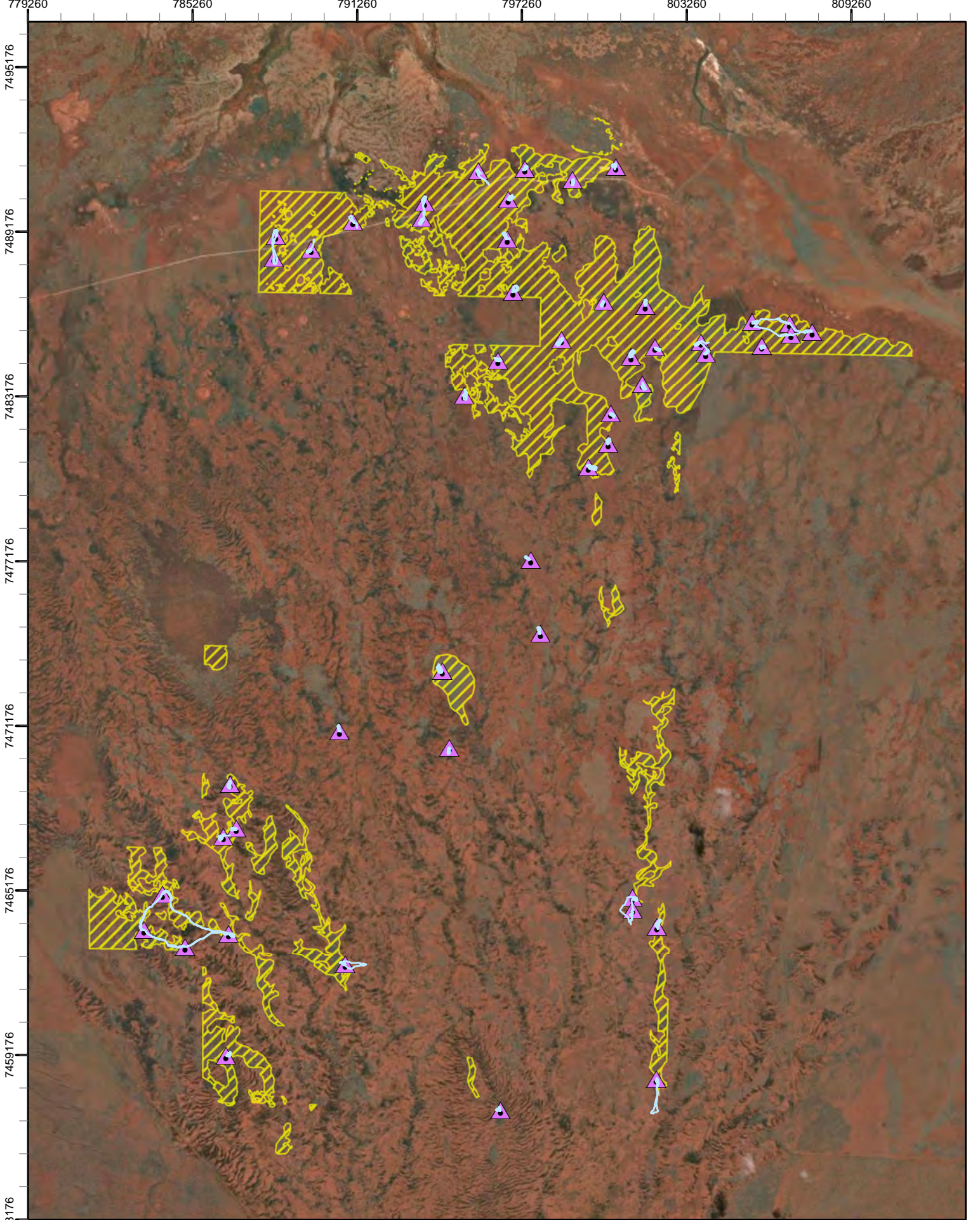
biologic
Environmental Survey

N
1:150,000




0 1 2 4
km

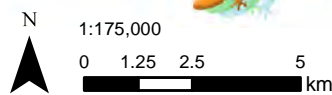
Roy Hill Holdings Pty Ltd
Targeted Fauna Survey
Fig. 3.2: Sampling locations within the Mine Area

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994
Size A4. Created 06/03/2020



Legend

-  Southern Borefields
-  Tracks
- Sampling site**
-  Greater bilby (survey plot)



Roy Hill Holdings Pty Ltd
Targeted Fauna Survey
Fig. 3.3: Sampling locations within Southern Borefields Area

Coordinate System: GDA 1994 MGA Zone 50
 Projection: Transverse Mercator
 Datum: GDA 1994 Size A4. Created 06/03/2020

4 RESULTS AND DISCUSSION

4.1 Greater Bilby

4.1.1 Previous Records

Greater bilby has previously been recorded 52 times within the Study Areas, 38 times within the Mine Study Area and a further 14 times from within the Southern Borefields Area (Table 4.1; Figure 1.1). Within the Mine Study Area, the species was first recorded in July 2018 in Mulga Woodland habitat near the Roy Hill Mine gatehouse, located in the south-western section of the Mine Study Area (Biologic, 2018; DBCA, 2020). A total of 38 records of the species, comprising diggings (n = 24), scats (n = 9), active burrows (n = 3) and tracks (n = 2), have been recorded within the Mine Study Area to date (Table 4.1). The species' presence was confirmed at the burrows using motion cameras, which have also been subject to ongoing monitoring to date. Genetic analysis of scat samples collected within the vicinity of the mine gatehouse during this time indicated that only a single individual was utilising the area (Dziminski & Carpenter, 2019). Roy Hill consulted with DBCA in regard to management of the Bilby individual and initiated measures to reduce potential for incidents, including installation of bilby signage and lowered the speed limits in the area which the bilby occupied. In September 2019, the individual was killed from a vehicle collision. Additionally, greater bilby have been recorded within the Southern Borefields Study Area a total of 14 times from secondary evidence, comprising potential old and/or inactive burrows (n = 9) and diggings (n = 5), all located within Spinifex Sandplain habitat (Table 4.1). All records of the species in the Southern Borefields Area were indicative of former occurrence within the area, with burrows and diggings considered old or inactive at the time of survey due to condition and/or lack of evidence of presence (Biologic, 2018).

Table 4.1: Summary of greater bilby records within and in the vicinity of the Mine Study Area and Borefields Study Area

Reference Source	Study Area	Date	Record Type	Latitude	Longitude	Habitat
DBCA (2020)	Mine Study Area	14/08/2018	Burrow (active) and diggings	-22.5176	119.9394	Mulga Woodland
Biologic (2018)	Southern Borefields	13/08/2017	Burrow (inactive)	-22.7188	119.9309	Spinifex Sandplain
Biologic (2018)	Southern Borefields	13/08/2017	Digging	-22.7183	119.9298	Spinifex Sandplain
Biologic (2018)	Southern Borefields	13/11/2018	Possible old Burrow (inactive)	-22.7136	119.9806	Spinifex Sandplain
Biologic (2018)	Southern Borefields	12/08/2017	Burrow (inactive)	-22.7087	119.9421	Spinifex Sandplain
Biologic (2018)	Southern Borefields	12/08/2017	Burrow (inactive)	-22.7080	119.9448	Spinifex Sandplain
Biologic (2018)	Southern Borefields	13/08/2017	Digging	-22.7066	119.9464	Spinifex Sandplain
Biologic (2018)	Southern Borefields	13/08/2017	Burrow (inactive)	-22.7065	119.9467	Spinifex Sandplain
Biologic (2018)	Southern Borefields	13/08/2017	Burrow (inactive)	-22.7065	119.9465	Spinifex Sandplain
Biologic (2018)	Southern Borefields	13/08/2017	Burrow (inactive)	-22.7054	119.9510	Spinifex Sandplain
Biologic (2018)	Southern Borefields	13/08/2017	Burrow (inactive)	-22.7053	119.9522	Spinifex Sandplain
Biologic (2018)	Southern Borefields	13/08/2017	Burrow (inactive)	-22.7052	119.9514	Spinifex Sandplain
Biologic (2018)	Southern Borefields	11/07/2018	Digging	-22.7029	119.9218	Spinifex Sandplain
Biologic (2018)	Southern Borefields	12/08/2017	Digging	-22.6827	119.9360	Spinifex Sandplain
Biologic (2018)	Southern Borefields	12/08/2017	Digging	-22.6816	119.9367	Spinifex Sandplain
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5166	119.9415	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Track	-22.5165	119.9385	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging (6)	-22.5164	119.9390	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5164	119.9379	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5164	119.9379	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Scat (old)	-22.5164	119.9379	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5164	119.9385	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5164	119.9380	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5163	119.9392	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5161	119.9393	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5161	119.9378	Mulga Woodland

Reference Source	Study Area	Date	Record Type	Latitude	Longitude	Habitat
Biologic (2018)	Mine Study Area	9/07/2018	Digging (6 new, 2old)	-22.5160	119.9377	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Scat (old)	-22.5159	119.9416	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Scat (old)	-22.5158	119.9415	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5158	119.9392	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5157	119.9397	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5156	119.9411	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Scat (new)	-22.5156	119.9417	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Track	-22.5155	119.9393	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Scat (new)	-22.5155	119.9418	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5155	119.9399	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Scat (new)	-22.5154	119.9412	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging (35+)	-22.5154	119.9417	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5154	119.9394	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging (multiple)	-22.5154	119.9399	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Scat (new)	-22.5153	119.9414	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging + scats	-22.5153	119.9396	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Burrow (active)	-22.5152	119.9413	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5152	119.9399	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5152	119.9400	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Burrow (active)	-22.5150	119.9416	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Scat (new)	-22.5150	119.9412	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5146	119.9411	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5146	119.9411	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5140	119.9407	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Digging	-22.5131	119.9403	Mulga Woodland
Biologic (2018)	Mine Study Area	9/07/2018	Scat (old)	-22.5130	119.9431	Mulga Woodland

4.1.2 Records During the Survey

During the current survey, the most likely habitat to support greater bilbies was surveyed via survey plots and transects in accordance with survey guidelines for the species (DBCA, 2017). Transect searches are considered an effective survey technique for the species where they provide extensive and representative coverage of all suitable habitat types, particularly in larger areas greater than 1,600 ha (DBCA, 2017). No greater bilby signs, tracks, scats, diggings or burrows, were recorded from the 93 survey plots and the 17.65 hrs of transect searches conducted in the Study Areas (Figure 3.2, Figure 3.3).

4.1.3 Occurrence Within the Study Areas

Extant populations of the greater bilby occur in a variety of habitats, including open tussock grassland, mulga woodland/shrubland and hummock grassland (Woinarski *et al.*, 2014). Typically, occurring on landforms with level to low slope topography, light to medium soils and rock feature substrates (Southgate, 1990b). Within the Pilbara region, the species is most frequently recorded within spinifex sandplains associated with paleo-drainage lines and perched drainage lines where the substrate of sand, soil, sandy clay, or sandy gravel is suitable for burrowing (Dziminski & Carpenter, 2017). Within these sandplain habitats, there is also an association with particular *Acacia* spp. containing root dwelling larvae that the species use for food resources (Dziminski & Carpenter, 2017). Recently burnt (within the last 1–3 years) examples of these habitats are also considered suitable habitat type for greater bilby (DBCA, 2017). Spinifex Sandplain is considered the preferred habitat for the species as it provides an adequate level of cover and deep sandy soils for burrowing. Mulga Woodland habitat is not typically considered a preferred habitat within the Pilbara region, though, the species is known to inhabit this habitat in other regions across its distribution, and therefore may utilise such areas if the conditions are favourable e.g. suitable soils for burrowing and abundance of food resources (Southgate, 1990b).

Within the Mine Study Area, potential greater bilby habitat is confined to Mulga Woodland habitat (10,817 ha, 39.12% of Mine Study Area). The habitat within the Mine Study Area is often heavily degraded from cattle grazing and trampling, resulting in low suitability habitat being provided for the species. The Southern Borefields Study Area contains suitable habitat in large areas of Spinifex Sandplain (1,023 ha, 3.57% of Mine and Southern Borefields Study Area) and some recently burnt areas. Majority of the Study Area has not been burnt for over six years, however, portions particularly within the Southern Borefields Study Area have been burnt recently (0–2 years). Based on the previous records of greater bilby from direct and secondary evidence (tracks, scats and diggings) within the Study Areas, Spinifex Sandplain should be considered of High significance. Mulga Woodlands is not typically considered preferred habitat within the Pilbara region, however, such areas may be utilised if conditions are favourable. Mulga Woodland surrounding the previous extant Bilby population of the Study Area was previously considered to be of High importance by Biologic (2018); however, given that this individual is no longer present within the area, and the fact this habitat provides no greater value than the surrounding Mulga Woodland, the entirety of this habitat within the Study Area is considered of Moderate significance.

Greater bilbies are highly cryptic and not easily observed, and in addition are often sparsely distributed across large areas, with individuals capable of moving large distances across the landscape (DBCA, 2017). The lack of observations of the species within the Study Area therefore does not necessitate that greater bilbies will not use the habitats of the Study Area in the future (DBCA, 2017). Given the lack of evidence suggesting current occupation, it is likely that the Study Area represents an area of fluctuating presence, and any occupation is likely to represent a ‘sink’ population rather than a ‘source’ population. Previous records of the species within the Study Areas, in combination with genetic evidence suggesting only a single individual occurred, indicates previous occurrence of the species within the Study Area was possibly the result of a transient or dispersing individual moving from other areas of suitable habitat outside the Study Areas.

4.2 Northern Quoll

4.2.1 Previous Records

There are no previous records of northern quoll within the Mine Study Area; however, the species has previously been recorded on three occasions from secondary evidence (scats) within 2 km to the north (Table 4.2). These previous records comprised two records of scats of unknown age collected in Low Rocky Hills habitat in 2013 (DBCA, 2020) and a single fresh scat in the same habitat in 2017 (Biologic, 2018), approximately 1.54 km and 1.91 km north of the Mine Study Area respectively.

Despite providing the most suitable habitat for northern quoll within the Mine Study Area, the Low Rocky Hills habitat was considered only moderately suitable for the species, particularly due to the habitat possessing few deep cracks, crevices and/or large boulder piles providing suitable denning/shelter habitat (Biologic, 2018). Based on the limited occurrence and suitability of habitat within the Mine Study Area, in addition to the paucity of records of the species in the vicinity, Biologic (2018) indicated the species was likely to only occur in low densities if permanent, or that previous records were potentially indicative of transient individuals dispersing from nearby populations.

Table 4.2: Summary of northern quoll records within and in the vicinity of the Mine Study Area

Reference Source	Date	Record Type	Latitude	Longitude	Habitat	Location in relation to Mine Study Area
DBCA (2020)	12/10/13	Scat	-22.4347	119.9918	Low Rocky Hills	1.54 km north
Biologic (2018)	10/08/17	Scat	-22.4313	119.9770	Low Rocky Hills	1.91 km north
Ecologia (2009)	No evidence recorded					
Phoenix (2011)	No evidence recorded					

4.2.2 Records During the Survey

The current survey recorded no additional northern quolls records from the four targeted motion camera transects (2,500 sampling nights) (Figure 3.2). Additionally, no evidence of northern quoll occurrence was recorded during the targeted searches, such as scats or tracks. Northern quolls have only been

confirmed near the Study Area through scat records (Biologic, 2018; DBCA, 2020). As sampling was undertaken in the late dry season, northern quoll populations are expected to have been at their absolute lowest, thus, restricting sampling to the female population and a low number of males. Due to the small amount of suitable habitat occurring within the Mine Study Area and combined targeted survey effort for the species, in the event of residing individuals occurring, it is expected they would have been detected.

4.2.3 Occurrence Within the Study Area

Habitat considered critical to the survival of northern quoll includes rocky habitats such as ranges, escarpments, mesas, gorges, breakaways, boulder fields, major drainage lines or treed creek lines, which provides shelter for breeding and refuge from fire or predators (DoE, 2016). Rocky habitats tend to support higher densities, as they offer protection from predators and are generally more productive in terms of availability of resources (Braithwaite & Griffiths, 1994; Oakwood, 2000).

The Low Rocky Hills (547.9 ha, 1.98% of Mine Study Area) observed within the Study Area is the most suitable habitat for the northern quoll, however, it is considered only low to moderately suitable for the species. The Low Rocky Hills possessed few deep cracks, crevices and few large boulder piles that are considered suitable for denning. The Major Drainage line habitat (1124.68 ha, 4.07%) can provide potential dispersal and foraging habitat for the species and are considered to be of moderate significance, more so when occurring in the vicinity of suitable denning habitat, particularly high suitability habitat. The habitat mapping is broad and encompasses instances of critical habitat, however, as they are of low-moderate suitability, they are not considered to be of high value for the species survival. The remainder of habitats present within the Mine Study Area are unlikely to provide significant habitat for the species and are considered to be of low significance.

Based on the work undertaken to date and the density of records compared to other areas in the vicinity of the Mine Study Area, it is likely that northern quoll occurrence within the area is infrequent. The species' occurrence within the Study Area is likely to be associated with transient and/or dispersing individuals, moving from other areas of habitat outside the Study Area, and/or during periods of regional population highs when the species is likely to be more abundant. Due to the low to moderate suitability of potential northern quoll habitat occurring within the Study Area and scarcity of records in the broader vicinity, the occurrence of a larger population residing, or establishing, within the Mine Study Area is unlikely.

4.3 Other Species of Conservation Significance

One non-target species of conservation significance was recorded during the current survey, brush-tailed mulgara (*Dasyercus blythi* – Priority 4 DBCA). The species is often associated with *Triodia* spp. grasslands on sandy or stony plains, particularly where mature spinifex hummocks occur (Körtner *et al.*, 2007; Pavey *et al.*, 2012; Woolley, 2006). The brush-tailed mulgara was recorded on five occasions in four locations within the Borefields Study Area (Table 4.3). One active burrow was recorded at site VROY-56 (Spinifex Sandplain) and four inactive burrows were recorded at VROY-73 (Spinifex Sandplain) during a survey plot for greater bilby. Additionally, tracks were opportunistically recorded twice within the southern end of the Borefields Study Area.

Table 4.3: Brush-tailed Mulgara Recorded During the Current Survey

Site	Record Type	Date	Latitude	Longitude
Opportunistic	Track	05/02/20	-22.9669	119.8906
Opportunistic	Track	05/02/20	-22.9208	119.8350
VROY-56	Burrow (active)	18/02/20	-22.6806	119.8049
VROY-73	3 x Burrow (inactive)	18/02/20	-22.7284	119.9373
VROY-73	Burrow (inactive)	18/02/20	-22.7291	119.9378

4.4 Potential Limitation and Constraints

The EPA (2016) outlines several potential limitations to fauna surveys. These aspects are assessed and discussed in Table 4.4 below.

Table 4.4: Survey limitations and constraints

Potential limitation or constraint	Limitation to current survey	Applicability to this survey
Experience of personnel.	No	The field personnel involved in the survey collectively have more than 30 years of fauna survey experience within the Pilbara and with the targeted species
Scope (faunal groups sampled and whether any constraints affect this)	No	<p>The scope was a targeted fauna survey and was conducted within that framework (EPA, 2016a).</p> <p>Northern quoll – The species was sampled following survey guidelines in relation to survey design and effort, site coverage, and detectability (DoE, 2016). Motion camera lines were set during the current survey; 2,500 sampling nights. Searches were undertaken for secondary evidence (e.g. scats).</p> <p>Greater bilby – The survey guidelines were followed, which recommends either linear transect searches, survey plot or a combination of both (DBCA, 2017). Targeted sampling for the greater bilby within the Study Area was conducted by 2-ha survey plots and walking transects through the most suitable habitat within the Study Area.</p>

Potential limitation or constraint	Limitation to current survey	Applicability to this survey
Proportion of fauna identified	No	All fauna recorded via motion camera were able to be accurately identified.
Sources of information (recent or historic) and availability of contextual information	No	Previous reports were available prior to the survey and were used to inform the planning and conduct of the survey.
Proportion of the task achieved	No	A targeted fauna survey of the Study Area was completed and related to the results of surveys in the broader area.
Timing / weather / season / cycle	Possible	In response to Roy Hill's desired timing for survey completion occurring outside of optimal sampling periods for northern quoll (i.e. prior to male die-off in April–September), a two phase sampling approach was undertaken in accordance with (DoE, 2016). Population size is expected to be at its lowest as sampling is restricted to females, reducing the likelihood of detection; however, in the event of a residing population, it is expected that individuals would have been recorded still.
Disturbances (e.g. fire or flood)	Partial	A cyclone occurred in both January and February 2020, potentially degrading or removing evidence (i.e. tracks, diggings).
Intensity of survey	No	A targeted survey was undertaken across the Study Area to assist with decisions on future environmental approvals. The survey intensity was high and focussed on the species of interest.
Completeness of survey	No	The survey was adequately completed to meet the requirements of a targeted survey.
Resources (e.g. degree of expertise available)	No	All resources required to complete the survey were available.
Remoteness or access issues	No	The majority of the Study Area was accessible either by vehicle or on foot, thus the sampling techniques used during this survey were unconstrained by accessibility or remoteness.

5 CONCLUSION

The overarching objective of this assessment was to fill knowledge gaps surrounding the occurrence of greater bilby and northern quoll within the Study Areas, specifically to clarify the likelihood of occurrence and determine the spatial and quantitative extent of occurrence of both species within the Study Areas.

5.1 Greater Bilby

Spinifex Sandplain is considered the preferred habitat for greater bilbies, however, Mulga Woodland can be utilised if there are enough resources (i.e. suitable burrowing substrates and food resources) available (Southgate, 1990b). The Spinifex Sandplain and Mulga Woodland habitat is considered potential greater bilby habitat, though there is minimal suitable habitat found within the Mine and Southern Borefields Study Area (Biologic, 2018; Ecologia, 2009).

The greater bilby has previously been identified within both the Mine Study Area and Southern Borefields Study Area and although there are species records within and in the vicinity of the study area, no records were found during the current study. One deceased individual was known to occur within the Mine Study Area, however, other secondary signs (e.g. burrows, diggings) identified in both the Mine Study Area and Southern Borefields Study Area in previous surveys were old or inactive, indicating previous but not current occurrence. The individual recorded was likely to be a transient or dispersing male as males regularly move large distances during this time, including three to five km between burrows on consecutive days and have been recorded moving up to 15 km over a few weeks (Southgate & Possingham, 1995). Males range more widely than females, overlapping with multiple female's home ranges and males are known to travel long distances looking for potential females or finding new resources (Southgate, 1990a).

Greater bilbies are highly cryptic species and are not easily identified within the landscape. Furthermore, climatic events such as the cyclones experienced in January and February 2020, may have disturbed or removed secondary evidence. Populations in the Pilbara are highly fragmented, with individuals sparsely distributed over large areas and moving widely throughout the landscape (DBCA, 2017; Pavey, 2006). Greater bilbies are recorded as having low site fidelity and high mobility (Southgate *et al.*, 2007). Despite intensive survey effort no evidence of tracks, scats and diggings were found, however, the high propensity for population movement across landscapes increase the probability that a single targeted survey may not detect bilby presence. The lack of observations of the species within the current survey therefore does not necessitate that greater bilbies will not use the habitats within the Mine and Southern Borefields Study Area in the future or have not used it in the past (DBCA, 2017). Based on the availability of suitable habitat and the presence of contemporary records, it is likely that the Study Area represents an area of fluctuating presence for the species. Previous records of the species within the Study Areas, in combination with genetic evidence suggesting only a single individual occurred; indicating previous occurrence of the species within the Study Area was possibly the result of a transient or dispersing individual moving from other areas of suitable habitat outside the Study Areas. Any occupancy is therefore likely representative of 'sink' population rather than a 'source' population.

5.2 Northern Quoll

DoE (2016) define habitat critical to the survival of the northern quoll as rocky habitats such as ranges, escarpments, mesas, gorges, breakaways, boulder fields, and major drainage lines. Within the Study Area, the Low Rocky Hills are considered to be only low to moderately suitable habitat for the northern quoll (Biologic, 2018; Ecologia, 2009). Medium and Minor drainage lines provide northern quoll with potential dispersal and foraging habitat from other permanent populations. The limited and low to moderate suitability habitat within the Mine Study Area is unlikely to support even a small permanent population.

The northern quoll was previously recorded by secondary evidence outside the Study Area within similar habitat, however, the records are sparse (Biologic, 2018; DBCA, 2020). The current study recorded no evidence or presence of the species within the Study Area despite intensive surveying in the suitable habitat available. Previous evidence recorded is likely to be a transient or dispersing individual moving through the area from other permanent populations. Northern quolls are known to travel up to 5 km for males and 2.8 km for females in a single nights movements (Henderson, 2015).

The timing of the survey makes it difficult to adequately define the dynamics of any population occurring, as populations are expected to have been at their lowest during the sampling period. However given that no evidence of the species was recorded whatsoever, it is very unlikely that the species occurs in the Study Area on a permanent basis and that if present (including previous records), it is likely to occur in low abundance or as transient/dispersing individuals.

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7 APPENDICES








Appendix A: Targeted fauna habitat assessments







Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-01	-22.4620, 120.0009	4/12/19	Medium Drainage Line	Medium Drainage Line	South	Low	Sandy Clay Loam	Evenly Spread	Limited Outcropping BIF	Pebbles (5-10cm)	Scarce	Acacia Shrubland, Scattered Eucalypts, Spinifex Hummock Grassland, Tussock Grassland	Nil	Moderate	Scarce	None	Prone to Flooding	Mining Exploration	Recent (0 to 2 yr)	0.4	
VROY-02	-22.5233, 120.0074	4/12/19	Low Rocky Hills	Low Rocky Hills	East	Moderate	Loam	Scarce	Moderate Outcropping CID	Pebbles (5-10cm)	Few Small Patches	Acacia Shrubland, Eucalypt Woodland, Spinifex Hummock Grassland	High	Low	Scarce	None	None	None Discernible	Moderate (3 to 5 yr)	0.8	
VROY-03	-22.4707, 120.0005	5/12/19	Low Rocky Hills	Low Rocky Hills	South/East	Steep	Clay Loam	Scarce	Moderate Outcropping BIF	Boulders (>61cm)	Scarce	Acacia Shrubland, Scattered Eucalypts, Spinifex Hummock Grassland, Tussock Grassland	Moderate	Nil	None	None	None	None Discernible	Recent (0 to 2 yr)	0.4	
VROY-04	-22.5017, 120.0136	5/12/19	Low Rocky Hills	Low Rocky Hills	North	Steep	Clay Loam	Many Small Patches	Moderate Outcropping BIF	Boulders (>61cm)	Scarce	Acacia Shrubland, Spinifex Hummock Grassland, Tussock Grassland	Moderate	Nil	None	None	None	None Discernible	Moderate (3 to 5 yr)	0.8	
VROY-05	-22.5707, 119.9745	5/12/19	Mulga Woodland	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Few Small Patches	Acacia Shrubland, Mulga Woodland	Nil	High	None	None	None	Cattle Grazing	Old (6+ yr)	0.8	







Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-06	-22.5149, 119.9408	4/12/19	Mulga Woodland	Stony Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Mulga Woodland, Senna, Eremophila	Nil	High	None	None	None	Mining Exploration, Road/ Access Track	Old (6+ yr)	0.6	
VROY-07	-22.9513, 119.7936	5/12/19	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Pebbles (5-10cm)	Scarce	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.6	
VROY-08	-22.6313, 120.1001	5/12/19	Open Tussock Grassland	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	None Discernible	Mulga Woodland, Low Herbs	Nil	Moderate	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.6	
VROY-09	-22.9112, 119.7938	5/12/19	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Few Large Patches	Acacia Shrubland, Mulga Woodland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.8	
VROY-10	-22.6127, 120.0069	6/12/19	Mulga Woodland	Gilgai Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Many Small Patches	Acacia Shrubland, Herbland	Nil	Moderate	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.6	
VROY-11	-22.9157, 119.7783	5/12/19	Spinifex Sandplain	Sandy/ Stony Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Pebbles (5-10cm)	Few Small Patches	Acacia Shrubland, Mulga Woodland, Spinifex Hummock Grassland	Nil	High	None	None	None	Cattle Grazing	Old (6+ yr)	0.8	

Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-12	-22.6063, 120.097	6/12/19	Mulga Woodland	Hardpan Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Mulga Woodland, Low Herbs, Themeda	Nil	Moderate	None	None	Prone to Flooding	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.4	
VROY-13	-22.9105, 119.7637	5/12/19	Spinifex Sandplain	Sandy/ Stony Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Pebbles (5-10cm)	Few Large Patches	Mulga Woodland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing	Old (6+ yr)	0.8	
VROY-14	-22.5875, 120.0909	6/12/19	Mulga Woodland	Hardpan Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Mulga Woodland, Buffel Grass	Nil	Moderate	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.4	
VROY-15	-22.8985, 119.7700	5/12/19	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Few Small Patches	Acacia Shrubland, Mulga Woodland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing	Moderate (3 to 5 yr)	0.6	
VROY-16	-22.5944, 120.0619	6/12/19	Mulga Woodland	Hardpan Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Buffel Grass	Nil	Low	None	None	None	Cattle Grazing, Weed Invasion	Old (6+ yr)	0.4	
VROY-17	-22.8792, 119.7912	5/12/19	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Pebbles (5-10cm)	Few Large Patches	Acacia Shrubland, Mulga Woodland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing, Road/ Access Track	Moderate (3 to 5 yr)	0.6	







Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-18	-22.6300, 120.0395	6/02/20	Open Tussock Grassland	Hardpan Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Tussock Grassland	Nil	Moderate	None	None	None	Cattle Grazing, Weed Invasion	Old (6+ yr)	0.4	
VROY-19	-22.8620, 119.7932	5/02/20	Spinifex Sandplain	Sandy/ Stony Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Pebbles (5-10cm)	Many Small Patches	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.8	
VROY-20	-22.6142, 120.0289	6/02/20	Open Tussock Grassland	Hardpan Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Tussock Grassland, Low Shrubs, Native Grasses	Nil	Moderate	None	None	None	Cattle Grazing, Road/ Access Track, Weed Invasion	Old (6+ yr)	0.6	
VROY-21	-22.9676, 119.8914	5/02/20	Spinifex Sandplain	Sandy/ Stony Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Pebbles (5-10cm)	Few Large Patches	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.8	
VROY-22	-22.5757, 120.0130	6/02/20	Cleared Area	Hardpan Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Moderate	None	None	None	Mining Exploration, Road/ Access Track	Old (6+ yr)	0.6	







Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-23	-22.9205, 119.8353	5/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Few Small Patches	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing	Old (6+ yr)	0.8	
VROY-24	-22.5724, 120.0456	6/02/20	Mulga Drainage Line	Hardpan Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Moderate	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.6	
VROY-25	-22.9062, 119.9456	6/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Few Small Patches	Acacia Shrubland, Mulga Woodland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing, Road/ Access Track	Moderate (3 to 5 yr)	0.6	
VROY-26	-22.5782, 120.0837	6/02/20	Cleared Area	Hardpan Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Few Small Patches	Acacia Shrubland, Mulga Woodland, Spinifex Hummock Grassland, Tussock Grassland, Weeds, Low Herbs	Nil	Moderate	None	None	None	Cattle Grazing, Mining Exploration, Road/ Access Track, Weed Invasion	Old (6+ yr)	0.4	
VROY-27	-22.9561, 119.9465	6/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Many Small Patches	Acacia Shrubland, Spinifex Hummock Grassland	Nil	High	None	None	None	Cattle Grazing	Old (6+ yr)	0.8	







Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-28	-22.5625, 120.0008	6/02/20	Mulga Woodland	Hardpan Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Moderate	None	None	None	Cattle Grazing, Road/ Access Track, Weed Invasion	Old (6+ yr)	0.4	
VROY-29	-22.8234, 119.8678	6/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Few Small Patches	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.8	
VROY-30	-22.4889, 119.9103	7/02/20	Cleared Area	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Pebbles (5-10cm)	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland, Low Herbs	Nil	Moderate	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.6	
VROY-31	-22.7554, 119.9181	6/02/20	Spinifex Sandplain	Sandy/ Stony Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Pebbles (5-10cm)	Few Small Patches	Acacia Shrubland, Mulga Woodland, Spinifex Hummock Grassland	Nil	High	None	None	None	Cattle Grazing, Road/ Access Track	Recent (0 to 2 yr)	0.6	
VROY-32	-22.4755, 119.9274	7/02/20	Mulga Woodland	Stony Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Pebbles (5-10cm)	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Moderate	None	None	None	Cattle Grazing, Mining Exploration, Road/ Access Track	Old (6+ yr)	0.4	
VROY-33	-22.7477, 119.9250	6/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Many Small Patches	Acacia Shrubland, Spinifex Hummock Grassland, Mallee	Nil	Very High	None	None	None	Cattle Grazing, Road/ Access Track, Rubbish/ Litter/ Old Homestead	Moderate (3 to 5 yr)	0.6	







Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-34	-22.4699, 119.8706	7/02/20	Open Tussock Grassland	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Tussock Grassland	Nil	Moderate	None	None	None	Cattle Grazing, Mining Exploration, Road/ Access Track	Old (6+ yr)	0.4	
VROY-35	-22.7189, 119.9324	6/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Scarce	Spinifex Hummock Grassland, Mallee Eucalypts	Nil	Very High	None	None	None	Cattle Grazing, Road/ Access Track	Recent (0 to 2 yr)	0.6	
VROY-36	-22.4507, 119.8718	7/02/20	Mulga Drainage Line	Drainage Area/ Floodplain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Pebbles (5-10cm)	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Moderate	None	None	Prone to Flooding	Cattle Grazing, Mining Exploration, Road/ Access Track	Old (6+ yr)	0.6	
VROY-37	-22.7136, 119.9077	6/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Scarce	Spinifex Hummock Grassland, Mallee	Nil	Very High	None	None	None	Cattle Grazing, Road/ Access Track	Recent (0 to 2 yr)	0.6	
VROY-38	-22.4507, 119.8720	7/02/20	Mulga Drainage Line	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Tussock Grassland	Nil	Moderate	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.6	
VROY-39	-22.7327, 119.8736	6/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Scarce	Acacia Shrubland, Spinifex Hummock Grassland, Mallee	Nil	Very High	None	None	None	Cattle Grazing, Road/ Access Track	Recent (0 to 2 yr)	0.6	







Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-40	-22.4556, 119.9483	7/02/20	Spinifex Stony Plain	Stony Plain	East	Low	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Low	None	None	None	Mining Exploration, Road/ Access Track	Old (6+ yr)	0.6	
VROY-41	-22.7209, 119.8853	6/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Many Small Patches	Acacia Shrubland, Mulga Woodland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.8	
VROY-42	-22.5002, 119.9588	7/02/20	Cleared Area	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Moderate	None	None	None	Mining Exploration, Road/ Access Track	Old (6+ yr)	0.4	
VROY-43	-22.6984, 119.8902	6/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Scarce	Mulga Woodland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing, Road/ Access Track	Recent (0 to 2 yr)	0.6	
VROY-44	-22.5120, 119.9635	7/02/20	Mulga Woodland	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Pebbles (5-10cm)	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Moderate	None	None	None	Cattle Grazing, Mining Exploration, Road/ Access Track	Old (6+ yr)	0.6	
VROY-45	-22.6810, 119.8877	6/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Scarce	Mulga Woodland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing, Road/ Access Track	Recent (0 to 2 yr)	0.6	







Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-46	-22.5293, 119.9758	7/02/20	Mulga Woodland	Stony Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Pebbles (5-10cm)	Evenly Spread	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Moderate	None	None	None	Cattle Grazing, Mining Exploration, Road/ Access Track	Old (6+ yr)	0.4	
VROY-47	-22.6679, 119.8878	6/02/20	Spinifex Sandplain	Sandy/ Stony Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.8	
VROY-48	-22.5382, 119.9601	7/02/20	Mulga Woodland	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Pebbles (5-10cm)	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Moderate	None	None	None	Cattle Grazing, Mining Exploration, Road/ Access Track	Old (6+ yr)	0.4	
VROY-49	-22.6577, 119.8936	6/02/20	Spinifex Sandplain	Sandy/ Stony Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Few Small Patches	Acacia Shrubland, Spinifex Hummock Grassland, Mallee	Nil	High	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.8	
VROY-50	-22.4732, 119.9086	17/02/20	Cleared Area	Drainage Area/ Floodplain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Pebbles (5-10cm)	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Moderate	None	Scarce	Prone to Flooding	Cattle Grazing, Road/ Access Track, Weed Invasion	Old (6+ yr)	0.4	
VROY-51	-22.6565, 119.9257	6/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Many Small Patches	Acacia Shrubland, Scattered Eucalypts, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing, Mining Exploration, Road/ Access Track	Old (6+ yr)	0.6	

Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-52	-22.4883, 119.9398	17/02/20	Cleared Area	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Moderate	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.8	
VROY-53	-22.5965, 119.9704	7/02/20	Open Tussock Grassland	Hardpan Plain	Flat	Flat	Clay Loam	Few Large Patches	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Scattered Eucalypts	Nil	Moderate	None	None	Creekline full from recent rain	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.6	
VROY-54	-22.5045, 119.9361	17/02/20	Mulga Woodland	Drainage Area/ Floodplain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Moderate	None	None	None	Cattle Grazing	Old (6+ yr)	0.8	
VROY-55	-22.5926, 119.9771	7/02/20	Mulga Woodland	Hardpan Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Moderate	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.6	
VROY-56	-22.6815, 119.8058	18/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Scarce	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing	Old (6+ yr)	1	
VROY-57	-22.5795, 119.9882	7/02/20	Mulga Woodland	Hardpan Plain	Flat	Flat	Clay Loam	Many Large Patches	Negligible	Pebbles (5-10cm)	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Moderate	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.8	







Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-58	-22.6887, 119.8052	18/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Scarce	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing	Old (6+ yr)	1	
VROY-59	-22.5627, 119.9869	7/02/20	Mulga Woodland	Minor Drainage Line	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Mulga Woodland	Nil	Low	None	None	None	Cattle Grazing, Mining Exploration, Road/ Access Track	Old (6+ yr)	0.4	
VROY-60	-22.6856, 119.8184	18/02/20	Spinifex Sandplain	Hardpan Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	None Discernible	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing	Old (6+ yr)	1	
VROY-61	-22.5886, 119.9552	7/02/20	Mulga Woodland	Hardpan Plain	Flat	Flat	Clay Loam	Many Large Patches	Negligible	Negligible	Evenly Spread	Mulga Woodland, Scattered Eucalypts, Tussock Grassland, Haikea	Nil	Moderate	Scarce	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.8	
VROY-62	-22.6762, 119.8330	18/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Few Small Patches	Acacia Shrubland, Spinifex Hummock Grassland	Nil	High	None	None	None	Cattle Grazing	Moderate (3 to 5 yr)	0.6	
VROY-63	-22.5738, 119.9605	7/02/20	Eucalypt Woodland	Hardpan Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Many Large Patches	Mulga Woodland, Scattered Eucalypts, Tussock Grassland	Nil	Low	Scarce	None	Scarce	Cattle Grazing	Old (6+ yr)	0.8	





Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-64	-22.6748, 119.8574	18/02/20	Spinifex Sandplain	Hardpan Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Scarce	Acacia Shrubland, Spinifex Hummock Grassland	Nil	High	None	None	None	Cattle Grazing	Old (6+ yr)	0.8	
VROY-65	-22.5639, 119.9528	7/02/20	Mulga Woodland	Hardpan Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Few Small Patches	Acacia Shrubland, Mulga Woodland	Nil	Low	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.6	
VROY-66	-22.6694, 119.8582	18/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Scarce	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing	Moderate (3 to 5 yr)	0.6	
VROY-67	-22.5483, 119.9359	7/02/20	Mulga Woodland	Stony Plain	Flat	Flat	Clay Loam	Many Large Patches	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland	Nil	Low	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.4	
VROY-68	-22.6588, 119.8770	18/02/20	Spinifex Sandplain	Hardpan Plain	Flat	Flat	Clay Loam Sandy	Evenly Spread	Negligible	Negligible	Few Small Patches	Acacia Shrubland, Scattered Eucalypts, Spinifex Hummock Grassland	Nil	High	None	None	None	Cattle Grazing	Old (6+ yr)	1	
VROY-69	-22.5299, 119.9363	7/02/20	Mulga Woodland	Hardpan Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Mulga Woodland	Nil	Low	None	None	None	Cattle Grazing, Mining Exploration, Road/ Access Track	Old (6+ yr)	0.4	

Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-70	-22.6610, 119.9104	18/02/20	Spinifex Sandplain	Hardpan Plain	North/East	Low	Clay Loam Sandy	Many Large Patches	Moderate Outcropping Calcrete	Pebbles (5-10cm)	Many Small Patches	Acacia Shrubland, Scattered Eucalypts, Spinifex Hummock Grassland	Nil	Moderate	Moderate	Scarce	None	Cattle Grazing	Old (6+ yr)	0.8	
VROY-71	-22.5157, 119.9338	7/02/20	Mulga Drainage Line	Drainage Area/ Floodplain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Many Small Patches	Acacia Shrubland, Mulga Woodland	Nil	Moderate	None	None	None	Cattle Grazing, Mining Exploration, Road/ Access Track	Recent (0 to 2 yr)	0.8	
VROY-72	-22.7010, 119.9224	18/02/20	Spinifex Sandplain	Hardpan Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Scarce	Acacia Shrubland, Mulga Woodland, Spinifex Hummock Grassland	Nil	High	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.8	
VROY-73	-22.7278, 119.9366	18/02/20	Spinifex Sandplain	Hardpan Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Few Small Patches	Acacia Shrubland, Spinifex Hummock Grassland	Nil	High	None	None	None	Cattle Grazing	Old (6+ yr)	0.8	
VROY-74	-22.7157, 119.9409	18/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Scarce	Spinifex Hummock Grassland	Nil	High	None	None	None	Cattle Grazing	Old (6+ yr)	0.8	
VROY-75	-22.7145, 119.9787	18/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Loam	Evenly Spread	Negligible	Negligible	Few Small Patches	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.8	

Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-76	-22.7066, 119.9751	18/02/20	Spinifex Sandplain	Hardpan Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Few Small Patches	Mulga Woodland, Low Herbs	Nil	High	None	None	None	Cattle Grazing	Old (6+ yr)	0.6	
VROY-77	-22.7022, 119.9372	18/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Loam	Evenly Spread	Negligible	Negligible	Scarce	Acacia Shrubland, Spinifex Hummock Grassland	Nil	High	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.8	
VROY-78	-22.8967, 119.9368	19/02/20	Spinifex Sandplain	Hardpan Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Negligible	Scarce	Acacia Shrubland, Tussock Grassland	Nil	Low	None	None	None	Cattle Grazing	Recent (0 to 2 yr)	0.6	
VROY-79	-22.9008, 119.9369	19/02/20	Spinifex Sandplain	Hardpan Plain	Flat	Flat	Sandy Clay Loam	None Discernible	Negligible	Negligible	Few Small Patches	Acacia Shrubland, Spinifex Hummock Grassland, Tussock Grassland	Nil	Low	None	None	None	Cattle Grazing	Old (6+ yr)	0.4	
VROY-80	-22.8485, 119.8708	19/02/20	Spinifex Sandplain	Hardpan Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Many Small Patches	Acacia Shrubland, Spinifex Hummock Grassland	Nil	High	None	None	None	Cattle Grazing	Old (6+ yr)	0.8	
VROY-81	-22.8764, 119.7957	19/02/20	Spinifex Sandplain	Hardpan Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Few Small Patches	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Moderate	None	None	None	Cattle Grazing	Moderate (3 to 5 yr)	0.6	

Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-82	-22.8438, 119.8317	19/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Loam	Evenly Spread	Negligible	Negligible	Scarce	Acacia Shrubland, Mulga Woodland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing	Old (6+ yr)	0.6	
VROY-83	-22.8105, 119.9023	19/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Loam	Evenly Spread	Negligible	Negligible	Many Small Patches	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing	Old (6+ yr)	0.8	
VROY-84	-22.7862, 119.8984	19/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Loam	Evenly Spread	Negligible	Negligible	Many Small Patches	Acacia Shrubland, Mulga Woodland, Spinifex Hummock Grassland, Tussock Grassland	Nil	High	None	None	None	Cattle Grazing	Recent (0 to 2 yr)	0.4	
VROY-85	-22.7376, 119.9257	19/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Loam	Evenly Spread	Negligible	Negligible	Many Small Patches	Acacia Shrubland, Mulga Woodland, Spinifex Hummock Grassland	Nil	High	None	None	None	Cattle Grazing	Recent (0 to 2 yr)	0.4	
VROY-86	-22.7137, 119.9570	19/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Loam	Evenly Spread	Negligible	Negligible	Scarce	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing	Old (6+ yr)	1	
VROY-87	-22.7174, 119.9589	19/02/20	Spinifex Sandplain	Sand Plain	Flat	Flat	Sandy Loam	Evenly Spread	Negligible	Negligible	Few Small Patches	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing	Old (6+ yr)	1	

Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-88	-22.7070, 119.9884	19/02/20	Spinifex Sandplain	Stony Plain	Flat	Flat	Sandy Loam	Evenly Spread	Negligible	Negligible	Scarce	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	None	Cattle Grazing	Old (6+ yr)	1	
VROY-89	-22.7095, 119.9864	19/02/20	Spinifex Sandplain	Hardpan Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Scarce	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Moderate	None	None	None	Cattle Grazing	Moderate (3 to 5 yr)	0.8	
VROY-90	-22.7106, 119.9890	19/02/20	Spinifex Sandplain	Hardpan Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	Negligible	Scarce	Acacia Shrubland, Spinifex Hummock Grassland	Nil	Moderate	None	None	None	Cattle Grazing	Moderate (3 to 5 yr)	0.8	
VROY-91	-22.4946, 119.8843	20/02/20	Mulga Woodland	Gilgai Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Negligible	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Low	None	None	None	Cattle Grazing, Mining Exploration, Road/ Access Track	Old (6+ yr)	0.6	
VROY-92	-22.4974, 119.9149	20/02/20	Mulga Woodland	Gilgai Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Negligible	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Low	None	None	None	Cattle Grazing, Mining Exploration, Road/ Access Track	Old (6+ yr)	0.6	
VROY-93	-22.5300, 119.9488	20/02/20	Mulga Woodland	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Negligible	Few Small Patches	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Low	None	None	None	Cattle Grazing, Mining Exploration, Road/ Access Track	Old (6+ yr)	0.6	

Site ID	Coord.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcrop Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollow <10cm	Hollow > 10cm	Water present	Disturbances	Last Fire	Condition	Photo
VROY-94	-22.5541, 119.9633	20/02/20	Mulga Woodland	Stony Plain	Flat	Flat	Clay Loam	None Discernible	Negligible	Negligible	Scarce	Acacia Shrubland, Mulga Woodland, Tussock Grassland	Nil	Low	None	None	None	Cattle Grazing, Mining Exploration, Road/ Access Track	Old (6+ yr)	0.6	
VROY-95	-22.6254, 120.0727	20/02/20	Open Tussock Grassland	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Few Small Patches	Acacia Shrubland, Tussock Grassland	Nil	Low	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.1	
VROY-96	-22.6106, 120.0536	20/02/20	Open Tussock Grassland	Gilgai Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible	Gravel (1-4cm)	Scarce	Acacia Shrubland, Tussock Grassland	Nil	Low	None	None	None	Cattle Grazing, Road/ Access Track	Old (6+ yr)	0.1	
VROY-97	-22.6062, 119.9675	20/02/20	Major Drainage Line	Drainage Area/ Floodplain	Flat	Flat	Clay Loam	Few Large Patches	Negligible	Negligible	Few Small Patches	Acacia Shrubland, Eucalypt Woodland, Tussock Grassland	Nil	Low	Moderate	Scarce	Prone to Flooding	Cattle Grazing, Weed Invasion	Moderate (3 to 5 yr)	0.1	

Appendix B: Non-target vertebrate fauna recorded during the current survey

Site ID	Latitude	Longitude	Sampling method	Observed	Genus	Species	Abundance	Comments
VROY-01	-22.462	120.0009	Motion Camera	14/01/2020	<i>Aves</i>	<i>sp.</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	29/12/2019	<i>Aves</i>	<i>sp.</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	5/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	11/01/2020	<i>Bos</i>	<i>taurus</i>	2	
VROY-01	-22.462	120.0009	Motion Camera	5/01/2020	<i>Bos</i>	<i>taurus</i>	3	
VROY-01	-22.462	120.0009	Motion Camera	6/01/2020	<i>Bos</i>	<i>taurus</i>	2	
VROY-01	-22.462	120.0009	Motion Camera	7/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	11/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	12/01/2020	<i>Bos</i>	<i>taurus</i>	2	
VROY-01	-22.462	120.0009	Motion Camera	13/01/2020	<i>Bos</i>	<i>taurus</i>	4	
VROY-01	-22.462	120.0009	Motion Camera	9/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	11/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	11/01/2020	<i>Bos</i>	<i>taurus</i>	2	
VROY-01	-22.462	120.0009	Motion Camera	12/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	5/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	5/01/2020	<i>Bos</i>	<i>taurus</i>	2	
VROY-01	-22.462	120.0009	Motion Camera	7/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	7/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	9/01/2020	<i>Bos</i>	<i>taurus</i>	2	
VROY-01	-22.462	120.0009	Motion Camera	9/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	11/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	11/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	12/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	5/01/2020	<i>Bos</i>	<i>taurus</i>	2	
VROY-01	-22.462	120.0009	Motion Camera	7/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	9/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	19/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	5/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	5/01/2020	<i>Bos</i>	<i>taurus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	16/12/2019	<i>Canis</i>	<i>lupus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	8/12/2019	<i>Canis</i>	<i>lupus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	24/12/2019	<i>Canis</i>	<i>lupus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	25/12/2019	<i>Canis</i>	<i>lupus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	12/01/2020	<i>Canis</i>	<i>lupus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	13/01/2020	<i>Canis</i>	<i>lupus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	26/12/2019	<i>Canis</i>	<i>lupus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	21/12/2019	<i>Canis</i>	<i>lupus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	21/12/2019	<i>Canis</i>	<i>lupus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	21/12/2020	<i>Canis</i>	<i>lupus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	8/01/2020	<i>Canis</i>	<i>lupus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	8/01/2020	<i>Canis</i>	<i>lupus</i>	1	

Site ID	Latitude	Longitude	Sampling method	Observed	Genus	Species	Abundance	Comments
VROY-04	-22.5017	120.0136	Motion Camera	11/12/2019	<i>Canis</i>	<i>lupus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	21/12/2019	<i>Canis</i>	<i>lupus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	21/12/2019	<i>Canis</i>	<i>lupus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	14/01/2020	<i>Taeniopygia</i>	<i>guttata</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	31/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	22/01/2020	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	10/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	23/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	29/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	31/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	13/01/2020	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	20/01/2020	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	21/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	11/01/2020	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	22/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	4/02/2020	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	27/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	11/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	12/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	13/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	14/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	14/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	15/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	16/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	17/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	17/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	18/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	22/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	2	
VROY-02	-22.5233	120.0074	Motion Camera	25/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	28/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	31/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	31/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	1/01/2020	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	5/01/2020	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	17/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	12/12/2019	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	20/01/2020	<i>Colluricincla</i>	<i>harmonica</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	14/12/2019	<i>Cracticus</i>	<i>nigrogularis</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	1/01/2020	<i>Egernia</i>	<i>formosa</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	31/12/2019	<i>Epthianura</i>	<i>tricolor</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	19/01/2020	<i>Felis</i>	<i>catus</i>	1	

Site ID	Latitude	Longitude	Sampling method	Observed	Genus	Species	Abundance	Comments
VROY-02	-22.5233	120.0074	Motion Camera	8/12/2019	<i>Felis</i>	<i>catus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	11/01/2020	<i>Felis</i>	<i>catus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	9/01/2020	<i>Felis</i>	<i>catus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	30/01/2020	<i>Geopelia</i>	<i>cuneata</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	23/01/2020	<i>Geopelia</i>	<i>cuneata</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	26/01/2020	<i>Geophaps</i>	<i>plumifera</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	1/02/2020	<i>Geophaps</i>	<i>plumifera</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	13/01/2020	<i>Gowidon</i>	<i>longirostris</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	4/01/2020	<i>Grallina</i>	<i>cyanleuca</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	9/12/2019	<i>Grallina</i>	<i>cyanleuca</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	18/12/2019	<i>Lichenostomus</i>	<i>keartlandi</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	18/12/2019	<i>Lichenostomus</i>	<i>keartlandi</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	25/12/2019	<i>Lichenostomus</i>	<i>keartlandi</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	29/12/2019	<i>Lichenostomus</i>	<i>keartlandi</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	11/01/2020	<i>Lichenostomus</i>	<i>keartlandi</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	12/01/2020	<i>Lichenostomus</i>	<i>keartlandi</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	22/01/2020	<i>Lichenostomus</i>	<i>keartlandi</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	29/01/2020	<i>Lichenostomus</i>	<i>keartlandi</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	29/01/2020	<i>Lichenostomus</i>	<i>keartlandi</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	30/01/2020	<i>Lichenostomus</i>	<i>keartlandi</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	11/01/2020	<i>Lichenostomus</i>	<i>keartlandi</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	15/01/2020	<i>Lichenostomus</i>	<i>keartlandi</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	22/01/2020	<i>Lichenostomus</i>	<i>penicillatus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	11/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	15/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	3/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	16/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	12/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	21/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	24/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	3/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	15/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	15/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	22/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	6/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	10/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	18/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	8/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	15/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	8/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	

Site ID	Latitude	Longitude	Sampling method	Observed	Genus	Species	Abundance	Comments
VROY-02	-22.5233	120.0074	Motion Camera	25/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	26/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	30/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	1/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	2/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	3/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	25/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	18/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	16/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	18/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	18/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	22/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	15/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	2/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	8/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	10/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	3/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	9/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	18/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	12/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	19/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	5/02/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	22/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	22/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	22/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	23/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	4/02/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	4/02/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	29/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	6/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	31/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	30/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	3/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	16/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	17/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	29/01/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	6/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	14/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	1/02/2020	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	14/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	

Site ID	Latitude	Longitude	Sampling method	Observed	Genus	Species	Abundance	Comments
VROY-04	-22.5017	120.0136	Motion Camera	26/12/2019	<i>Osphranter</i>	<i>robustus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	28/12/2019	<i>Osphranter</i>	<i>rufus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	19/01/2020	<i>Osphranter</i>	<i>rufus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	16/01/2020	<i>Osphranter</i>	<i>rufus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	15/12/2019	<i>Osphranter</i>	<i>rufus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	24/12/2019	<i>Osphranter</i>	<i>rufus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	29/12/2019	<i>Oreoica</i>	<i>gutturalis</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	11/01/2020	<i>Pachycephala</i>	<i>rufiventris</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	30/12/2019	<i>Phaps</i>	<i>chalcoptera</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	16/12/2019	<i>Phaps</i>	<i>chalcoptera</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	22/12/2019	<i>Rhipidura</i>	<i>leucophrys</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	21/12/2019	<i>Rhipidura</i>	<i>leucophrys</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	24/12/2019	<i>Rhipidura</i>	<i>leucophrys</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	21/01/2020	<i>Rhipidura</i>	<i>leucophrys</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	5/12/2019	<i>Tachyglossus</i>	<i>aculeatus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	13/12/2019	<i>Tachyglossus</i>	<i>aculeatus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	7/01/2020	<i>Tachyglossus</i>	<i>aculeatus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	30/12/2019	<i>Tachyglossus</i>	<i>aculeatus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	30/12/2019	<i>Tachyglossus</i>	<i>aculeatus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	29/12/2019	<i>Tachyglossus</i>	<i>aculeatus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	30/12/2019	<i>Tachyglossus</i>	<i>aculeatus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	30/01/2020	<i>Tachyglossus</i>	<i>aculeatus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	16/12/2019	<i>Tachyglossus</i>	<i>aculeatus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	21/12/2019	<i>Tachyglossus</i>	<i>aculeatus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	11/12/2019	<i>Tachyglossus</i>	<i>aculeatus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	15/12/2019	<i>Tachyglossus</i>	<i>aculeatus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	22/01/2020	<i>Tachyglossus</i>	<i>aculeatus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	3/02/2020	<i>Tachyglossus</i>	<i>aculeatus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	27/01/2020	<i>Tachyglossus</i>	<i>aculeatus</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	12/01/2020	<i>Taeniopygia</i>	<i>guttata</i>	2	
VROY-01	-22.462	120.0009	Motion Camera	12/01/2020	<i>Taeniopygia</i>	<i>guttata</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	23/01/2020	<i>Todiramphus</i>	<i>sanctus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	20/01/2020	<i>Varanus</i>	<i>acanthurus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	26/01/2020	<i>Varanus</i>	<i>acanthurus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	29/01/2020	<i>Varanus</i>	<i>acanthurus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	21/01/2020	<i>Varanus</i>	<i>acanthurus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	27/12/2019	<i>Varanus</i>	<i>acanthurus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	27/01/2020	<i>Varanus</i>	<i>acanthurus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	18/12/2019	<i>Varanus</i>	<i>acanthurus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	15/12/2019	<i>Varanus</i>	<i>acanthurus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	26/12/2019	<i>Varanus</i>	<i>acanthurus</i>	1	

Site ID	Latitude	Longitude	Sampling method	Observed	Genus	Species	Abundance	Comments
VROY-03	-22.4707	120.0005	Motion Camera	5/12/2019	<i>Varanus</i>	<i>acanthurus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	10/01/2020	<i>Varanus</i>	<i>acanthurus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	31/01/2020	<i>Varanus</i>	<i>acanthurus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	19/12/2019	<i>Varanus</i>	<i>acanthurus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	25/01/2020	<i>Varanus</i>	<i>acanthurus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	17/12/2019	<i>Varanus</i>	<i>acanthurus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	24/12/2019	<i>Varanus</i>	<i>brevicauda</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	22/01/2020	<i>Varanus</i>	<i>brevicauda</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	9/12/2019	<i>Varanus</i>	<i>brevicauda</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	18/12/2019	<i>Varanus</i>	<i>brevicauda</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	25/12/2019	<i>Varanus</i>	<i>brevicauda</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	27/01/2020	<i>Varanus</i>	<i>giganteus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	4/01/2020	<i>Varanus</i>	<i>giganteus</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	22/01/2020	<i>Varanus</i>	<i>gouldii</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	5/01/2020	<i>Varanus</i>	<i>hamersleyensis</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	31/01/2020	<i>Varanus</i>	<i>hamersleyensis</i>	2	
VROY-02	-22.5233	120.0074	Motion Camera	29/01/2020	<i>Varanus</i>	<i>hamersleyensis</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	9/01/2020	<i>Varanus</i>	<i>hamersleyensis</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	26/01/2020	<i>Varanus</i>	<i>hamersleyensis</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	24/12/2019	<i>Varanus</i>	<i>hamersleyensis</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	22/01/2020	<i>Varanus</i>	<i>hamersleyensis</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	20/12/2019	<i>Varanus</i>	<i>hamersleyensis</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	21/12/2019	<i>Varanus</i>	<i>panoptes</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	11/01/2020	<i>Varanus</i>	<i>panoptes</i>	1	
VROY-01	-22.462	120.0009	Motion Camera	23/01/2020	<i>Varanus</i>	<i>panoptes</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	30/01/2020	<i>Varanus</i>	<i>sp.</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	17/12/2019	<i>Varanus</i>	<i>sp.</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	28/01/2020	<i>Varanus</i>	<i>sp.</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	30/01/2020	<i>Varanus</i>	<i>sp.</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	31/01/2020	<i>Varanus</i>	<i>sp.</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	3/02/2020	<i>Varanus</i>	<i>sp.</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	20/01/2020	<i>Varanus</i>	<i>sp.</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	16/12/2019	<i>Varanus</i>	<i>sp.</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	28/12/2019	<i>Varanus</i>	<i>sp.</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	11/01/2020	<i>Varanus</i>	<i>sp.</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	22/12/2019	<i>Varanus</i>	<i>sp.</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	30/12/2019	<i>Varanus</i>	<i>sp.</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	13/01/2020	<i>Varanus</i>	<i>sp.</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	29/01/2020	<i>Varanus</i>	<i>sp.</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	18/01/2020	<i>Varanus</i>	<i>tristis</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	7/01/2020	<i>Varanus</i>	<i>tristis</i>	1	

Site ID	Latitude	Longitude	Sampling method	Observed	Genus	Species	Abundance	Comments
VROY-04	-22.5017	120.0136	Motion Camera	7/12/2019	<i>Varanus</i>	<i>tristis</i>	1	
VROY-02	-22.5233	120.0074	Motion Camera	25/01/2020	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	4/01/2020	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	18/01/2020	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	4/01/2020	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	3/01/2020	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	4/01/2020	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	6/01/2020	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	15/12/2019	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	3/01/2020	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	4/01/2020	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	5/01/2020	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	8/01/2020	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	9/01/2020	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	11/01/2020	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-03	-22.4707	120.0005	Motion Camera	19/01/2020	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	11/01/2020	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	14/12/2019	<i>Zyzomys</i>	<i>argurus</i>	1	
VROY-04	-22.5017	120.0136	Motion Camera	2/01/2020	<i>Zyzomys</i>	<i>argurus</i>	1	
Opp	-22.967	119.8906	Opportunistic	2020-02-05	<i>Dasyercus</i>	<i>blythi</i>	1	Track
Opp	-22.9208	119.835	Opportunistic	2020-02-05	<i>Dasyercus</i>	<i>blythi</i>	1	Track
VROY-56	-22.6807	119.805	Opportunistic	2020-02-18	<i>Dasyercus</i>	<i>blythi</i>	1	Burrow (active)
VROY-73	-22.7285	119.9374	Opportunistic	2020-02-18	<i>Dasyercus</i>	<i>blythi</i>	1	Burrow (inactive), 3 seen
VROY-73	-22.7291	119.9378	Opportunistic	2020-02-18	<i>Dasyercus</i>	<i>blythi</i>	1	Burrow (inactive)