



Flora and Fauna Assessment

Rover 1 Exploration Decline Project

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Prepared for: Westgold Resources Limited



2012



Executive Summary

Westgold Resources Limited (a subsidiary of Castile Resources) intends to develop an Exploration Decline at Rover 1, Tennant Creek region, Northern Territory. EcOz Environmental Services was contracted by Westgold Resources Limited (Westgold) to undertake a detailed and thorough biodiversity assessment of the project.

A standard fauna and flora survey comprising six sites was conducted during April 2011.

A desktop survey identified 2 amphibians, 24 reptiles, 84 birds, and 7 mammals have been recorded in the vicinity of the project area. The field survey recorded a total of 76 native fauna species, comprising of no amphibians, 20 reptiles, 48 birds, and 8 mammals. Four introduced species were identified. No Commonwealth threatened species were recorded during the field survey, but one Northern Territory listed threatened species was: Australian Bustard (*Ardeotis australis*) which is listed as Vulnerable.

A desktop survey identified that 384 flora species have been recorded in the vicinity of the project area, none of which are threatened. The field survey recorded a total of 64 flora species. No threatened flora species were identified during the surveys nor were any listed weeds.

The high summer rainfall weather conditions in the months leading up to the survey resulted in a vegetation boom across the site, and many grasses, forbs, shrubs and trees have seeded and fruited providing plentiful resources to a wide variety of fauna species. The weather conditions during the survey were warm dry days with cold nights (temperature range of 14 to 29 C), which probably reduced nocturnal reptile activity.

A desktop survey indicated that ten species listed as threatened under NT and/or federal legislation could exist at the proposed site. Five of these have been identified as likely or known to occur, and are discussed in detail. These species are Australian Bustard (*Ardeotis australis*), Brush-tailed Mulgara (*Dasycercus blythi*), Greater Bilby (*Macrotis lagotis*), Great Desert Skink (*Egernia kintorei*), and Emu (*Dromaius novaehollandiae*).

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1 Introduction

Westgold Resources Limited (a subsidiary of Castile Resources) intends to develop an Exploration Decline at Rover 1, Tennant Creek region, Northern Territory. EcOz Environmental Services was contracted by Westgold Resources Limited (Westgold) to undertake a detailed and thorough biodiversity assessment of the project.

1.1 Focus Area

The project site is approximately 60 km from the Stuart Highway and 55 km from the Darwin-Adelaide railway line. By road, Tennant Creek is approximately 90 km from the project area. The project location is shown in Figure 1.

Westgold are currently proving up a gold resource at this location and are planning on developing an underground mining operation. The target resource is several hundred metres below the surface, thus Westgold are proposing to construct an exploration decline such that the drilling program is more cost effective. This strategy will allow Westgold to confirm the extent of the resource during exploration and therefore design and extend the decline for mining purposes pending mining approval process.

The Rover 1 deposit is located on Exploration Leases EL24989 and EL24541. The extent of impact to the Rover 1 area will depend primarily on exploration drilling results which will prove up the extent and depth of mineral resources.

The Rover 1 underground mining development is anticipated to be to reach a depth of 600 metres, which will include approximately 172 ha of vegetation clearing for associated infrastructure (i.e. tailings storage facility, decline box cut, mine camp, airstrip, borrow pits, waste rock dumps, laydown area, and process area).

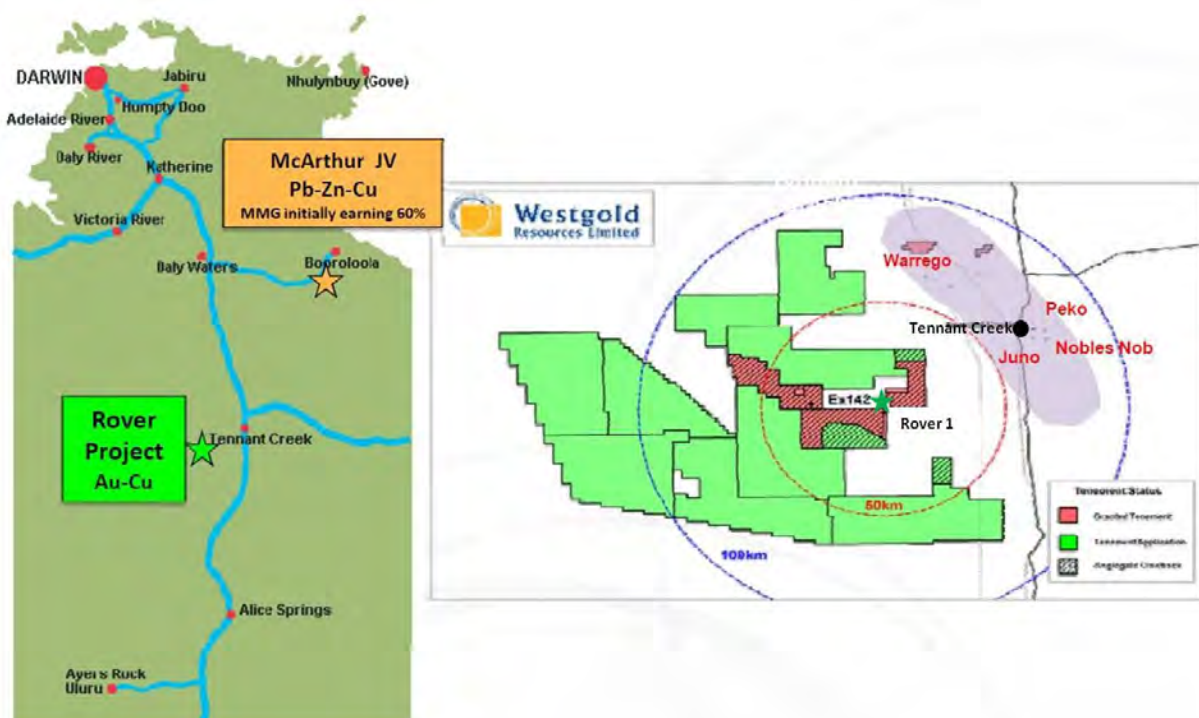


Figure 1: Rover 1 Project Location

1.2 Scope of Work

This report presents information collected from a desktop study and field survey for the Rover 1 project area. This will facilitate understanding of the environmental attributes at the site, and will help to identify potential impacts on the environment to inform management decisions associated with the project (i.e. to mitigate impact on threatened flora and fauna).

The objectives of this environmental study are to:

- Collate all available environmental information from the local area and wider region such that potential impacts from the proposed development on the environment may be assessed in the future;
- Collate all available baseline environmental information to provide the foundation for ground-truthing through targeted environmental surveys;
- Present and discuss information collected from onsite flora and fauna surveys; and
- Identify and explain the potential presence of threatened flora and fauna species in the general area.

2 Desktop Review

2.1 Methodology

The environmental attributes and their implications for the proposed Rover 1 development have been interrogated by referring to and collating information from all relevant NT and Federal Government held databases. The data enquiry has ranged from broad scale assessment of climate, geomorphology, land systems, land units, vegetation mapping, and distribution of flora and fauna through to investigation of specific habitat preferences, potential presence of notable species (listed under Northern Territory or Australian Government environmental legislation).

Databases and information sources searched for the purposes of this desktop review included:

- EPBC Act Protected Matters Search Tool (online)
- NT Flora and Fauna Atlas Database, held by the NT Parks and Wildlife Service (PWSNT)
- NT Museum and NT Herbarium (Holtze database) specimen records
- NRM Infonet Search Tool (online)
- Land System mapping and descriptions held by the NT Government (digital data request)
- Australian Soil Resource Information System (online)
- Climate data from the Bureau of Meteorology (BOM) website
- Reports on previous surveys and studies conducted within the vicinity of the project area
- Specific scientific papers, reference books and specialised expertise

The search area for digital database requests included a 10 km radius area from the Rover 1 project area. Inclusion of a buffer within the search area facilitates understanding of potential impacts to sensitive species or habitats close to the project area, and fauna species that may move through the project area, or utilise habitats within the project area at certain times of the year.

2.2 Climate

The project area lies within the semi-arid climate of Australia and experiences monsoon influences from the north. Higher temperatures and rainfall are generally experienced in the “summer” months (Figure 2). The closest Bureau of Meteorology weather station to the project site is located at Tennant Creek Airport (Station 015135), approximately 70 km to the northeast. Average maximum temperatures at Tennant Creek range from 24.5°C in the cooler months (May to August) up to 37.2°C during the warmer months (September through to April) (Figure 2). Mean rainfall in the region ranges from 1.6 mm in August to 122.4 mm in February (Figure 2), however, rainfall is very unpredictable in Central Australia due to the potential for huge fluctuations from 100 to 500 mm (or more) per year. For example, Tennant Creek experienced a total of 823.6 mm in 2010. Long extended dry periods followed by high rainfall events result in a typical boom and bust environment, which influences the presence of many arid flora and fauna species during these times.

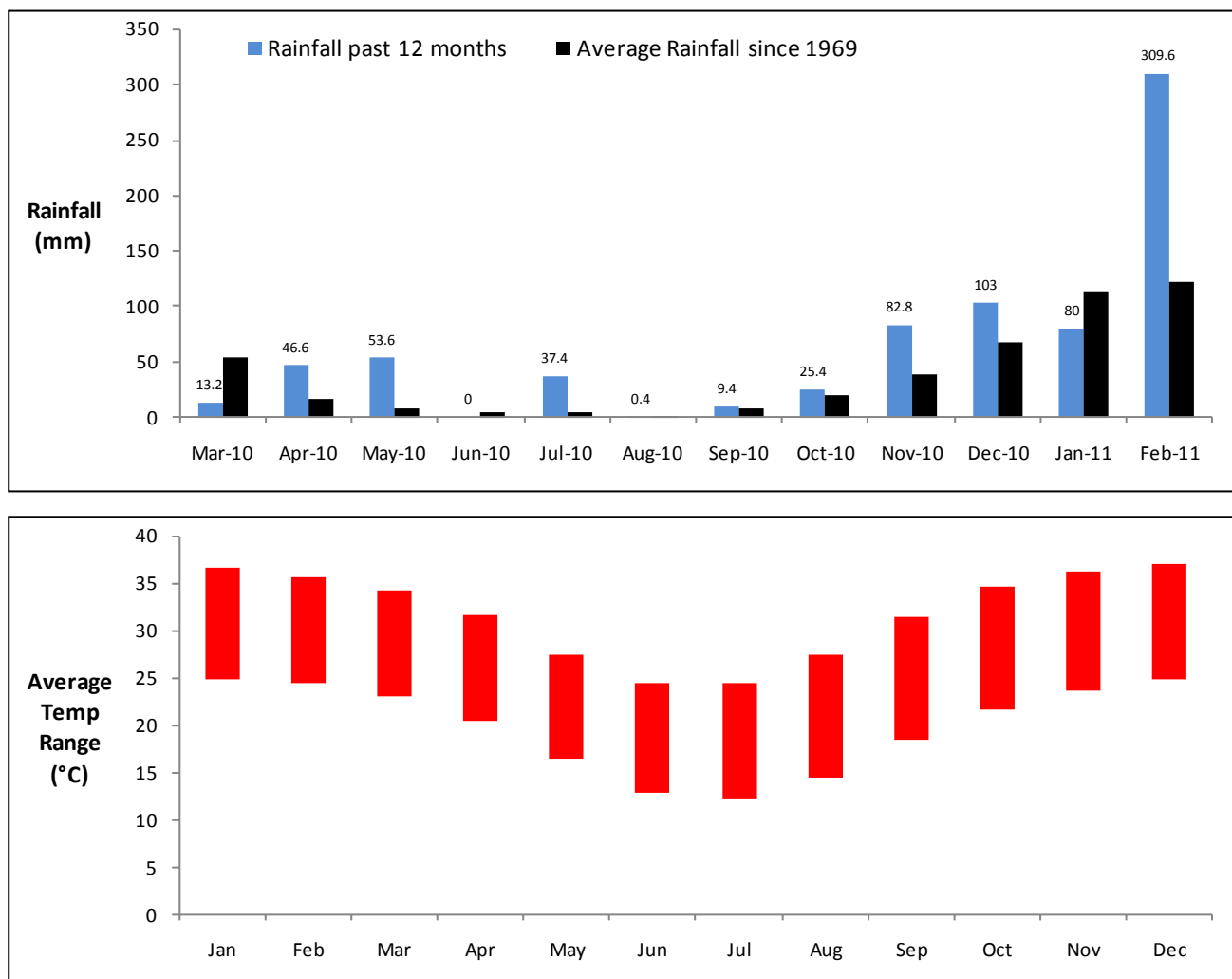


Figure 2: Rainfall and temperature information from Tennant Creek Airport

2.3 Land Systems

The project area lies within an extensive land system type known as the Singleton Land System, which is basically described as Spinifex sand plains. There are two main units within Singleton LS, which are described in Table 1 and mapped in Figure 3. The Rover 1 exploration decline project area falls within unit 1.

Table 1: Description of Singleton Land System

Unit	Description	Extent	Landform	Soils	Vegetation
1	Spinifex sand plain	Very large	Level plain. Occasional low rise and very broad swales.	Red clayey sands	Sparse tress (Mulga, Mallee, Desert Oak, Beefwood, Bloodwood) and shrubs over spinifex with very minor woollybutt, kerosene grass and forbs. Small areas with mulga over mainly kerosene grass and woollybutt.
2	Mulga drainage	Very small	Broad drainage depression	Red earths	Mulga and occasional coolabah or ironwood over spinifex and woollybutt or oat grass and forbs.

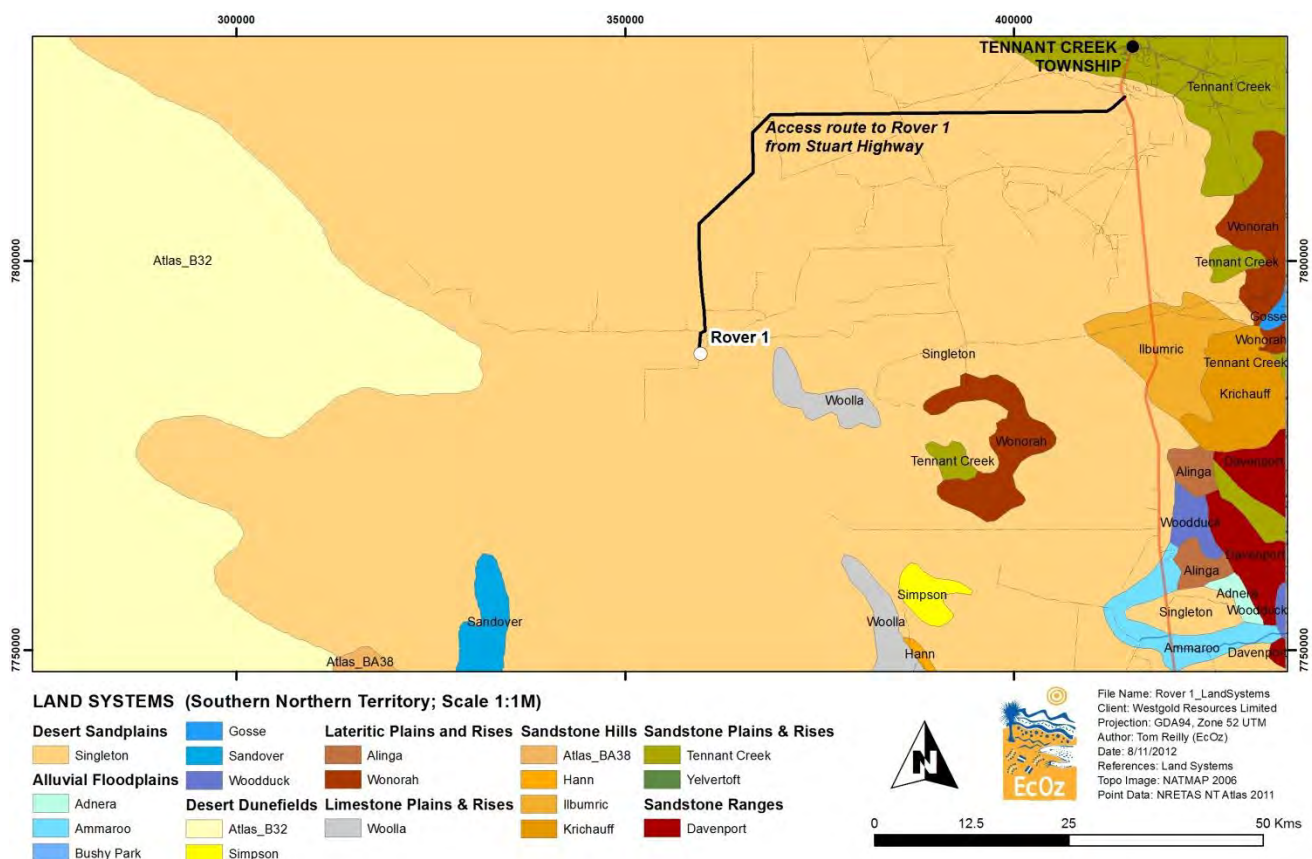


Figure 3: Land System map of Rover 1 project area and surrounds

2.4 Bioregion

The Interim Biogeographic Regionalisation for Australia (IBRA) divides Australia into units of broadly similar landform, geology and biodiversity (Baker *et al.* 2005). There are 12 bioregions wholly within the Territory, and another 13 that are shared with neighbouring states. The project area is situated within the Tanami bioregion. The attributes, natural values, risks and management priorities of these regions are summarised from the Northern Territory Bioregions – Assessment of Key Biodiversity Values and Threats (Baker *et al.* 2005).

The Tanami Bioregion is characterised by red Quaternary sand plains. Older Permian and Proterozoic formations appear as hills and outcrops from underneath the sandy layer. Dominated by Acacias in the upper story and Spinifex grasses in the lower story, the Tanami bioregion begins in WA and extends across much of central NT. Land tenure over the Tanami bioregion consists predominately of Aboriginal freehold land and pastoral lease, with crown or vacant land making up the rest of the area. There are no national parks within the Tanami Bioregion, nor are there any listed protected areas. Lake surprise, within the Tanami bioregion, is listed as an important wetland of Australia, and a further 8 wetlands are listed as being important and are considered as potential additions to the Directory of Important Wetlands of Australia (DIWA). There are thirty-one sites listed as sites of botanical significance within the Tanami Bioregion however no important colonies or breeding sites for fauna species have been identified (Baker *et al.* 2005).

2.5 Fire Activity

Fire plays a major role in shaping the landscape throughout Central Australia, both through natural and human induced burning practices (Latz 1995). As a result, fire tolerant/dependent plants have become dominant in the region while fire sensitive plants are more sparsely distributed (Latz 1995). According to hotspot fire mapping (provided by NAFI) of the Rover 1 project area, the frequency of wild fire at the site is low. However, it must be noted that fire data available for this location may not be accurate. Field surveys indicated a relatively high fuel load at the site, and did not note any recent fire scarring on vegetation. The Spinifex sand plain that dominates the Rover 1 project area is several years unburnt. Figure 4 indicates that only one or two fires have occurred within the area between 1997 and 2010, with these fires occurring before 2004 (according to hot spot and fire scar mapping supplied by NAFI).

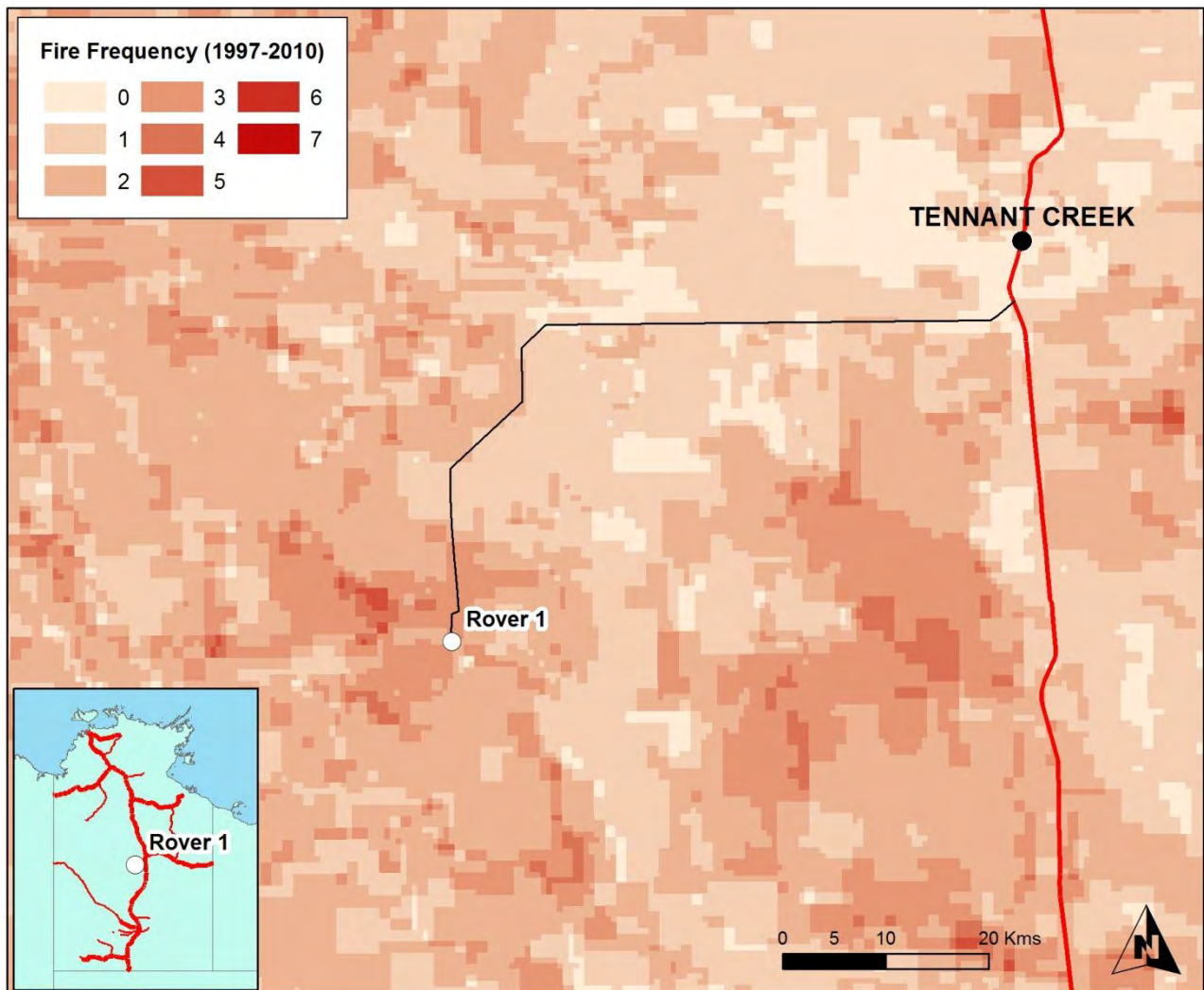


Figure 4: Fire history of the project area (years burnt)
(data sourced from the NAFI website).

2.6 Biodiversity

2.6.1 Vegetation Communities

The Northern Territory is divided up into five distinct Botanical Provinces. These are the Darwin and Gulf Region, Victoria River District, Barkly Tablelands Region, Central Region North and Central Region South. The project area lies within the Central Region North.

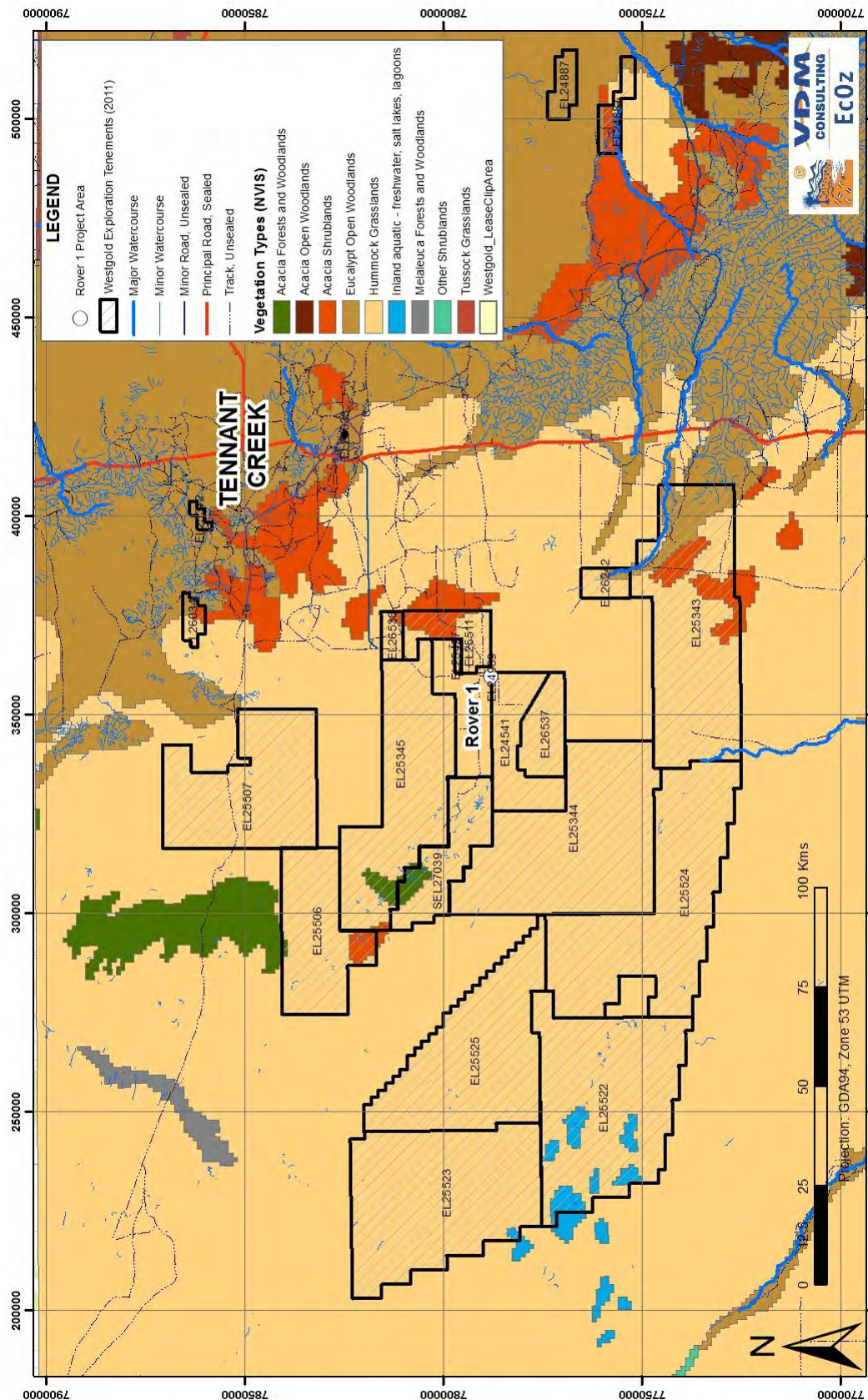
The main vegetation type in the Rover 1 project area is classified as mapping unit 76 by Wilson *et al.* (1990). This is defined as “*Triodia pungens* (Soft Spinifex) and *Plectrachne schinzii* (Curly Spinifex) hummock grassland with *Acacia* tall sparse-shrubland overstorey”. The Tanami Desert is dominated by this vegetation type which grows on flat to gently undulating red sand plains (Wilson *et al.* 1990). Inspection of aerial images also identify that there may be a few small groves of Mulga (*Acacia aneura*) in the proposed development area.

Three vegetation types (defined by Wilson *et al.* 1990) are identified within the wider area. These are mapped in Figure 5 with summary descriptions in Table 2.

These vegetation units have been groundtruthed and further refined as part of the Rover 1 flora and fauna assessment (see Section 4.1).

Table 2: Vegetation Communities located within the vicinity of the Rover 1 project area

Vegetation Community Description (Wilson <i>et al.</i> 1990)	
Spinifex Grassland (<i>Triodia pungens</i> and <i>T. schinzii</i>) with <i>Acacia</i> tall sparse shrubland overstorey	
High coverage within Rover 1	<i>Triodia pungens</i> is the dominant ground layer species with <i>Triodia schinzii</i> often occurring as a subdominant but commonly dominating in pure stands. The shrub layer consists of mainly <i>Acacia</i> and <i>Hakea</i> species such as <i>Acacia coriacea</i> , <i>Acacia dictyophleba</i> , and <i>Hakea macrocarpa</i> . There are scattered low tree eucalypts such as <i>Eucalyptus opaca</i> and <i>Corymbia aparrarinja</i> .
<i>Acacia aneura</i> (Mulga) tall open shrubland with open grassland understorey	
Low coverage within Rover 1	The upper layer is dominated by <i>Acacia aneura</i> (Mulga) usually as a tall open shrubland or woodland. Canopy could exceed 30% cover. The mid storey is often very sparse. The ground cover is generally a mixed-species tussock grassland, commonly <i>Eragrostis eriopoda</i> (Woolly Butt Grass) with forbs and graminoids.
<i>Eucalyptus coolibah</i> (Coolibah) low open woodland with open grassland understorey	
Does not occur within Rover 1	<i>Eucalyptus microtheca</i> (Coolibah) dominates the low open woodland upper layer in monospecific stands or in combination with <i>Acacia coriacea</i> (Dogwood) and other low tree species. <i>Carissa lanceolata</i> (Conker Berry) is a common component of the sparse shrub layer. The ground cover is variable, usually dominated by tussock grasses such as <i>Chrysopogon fallax</i> , however on sandier soils <i>Triodia pungens</i> (Soft Spinifex) tends to dominate.



2.6.2 Existing Fauna Records

Existing NT Fauna Atlas records indicate that 2 amphibian, 24 reptile, 84 bird, and 7 mammal species have been identified in the vicinity of the Rover 1 project area (see Appendix B for species names). Only one of these species is regarded as threatened in Northern Territory, the Australian Bustard (*Ardeotis australis*) – Vulnerable under the *Territory Parks and Wildlife Conservation Act (TPWC Act)*. Data records have been mapped in Figure 6 to highlight minimal survey effort in the vicinity of the project (according to NRETAS datasets that are linked to formal permitted biological surveys in the Northern Territory).

Three recorded species are listed as Near Threatened under the *TPWC Act*:

- Woma Python (*Aspidites ramsayi*)
- Spectacled Hare-wallaby (*Lagorchestes conspicillatus*)
- Bush Stone-curlew (*Burhinus grallarius*)

No fauna records existed on the Darwin Museum database for the area of interest.

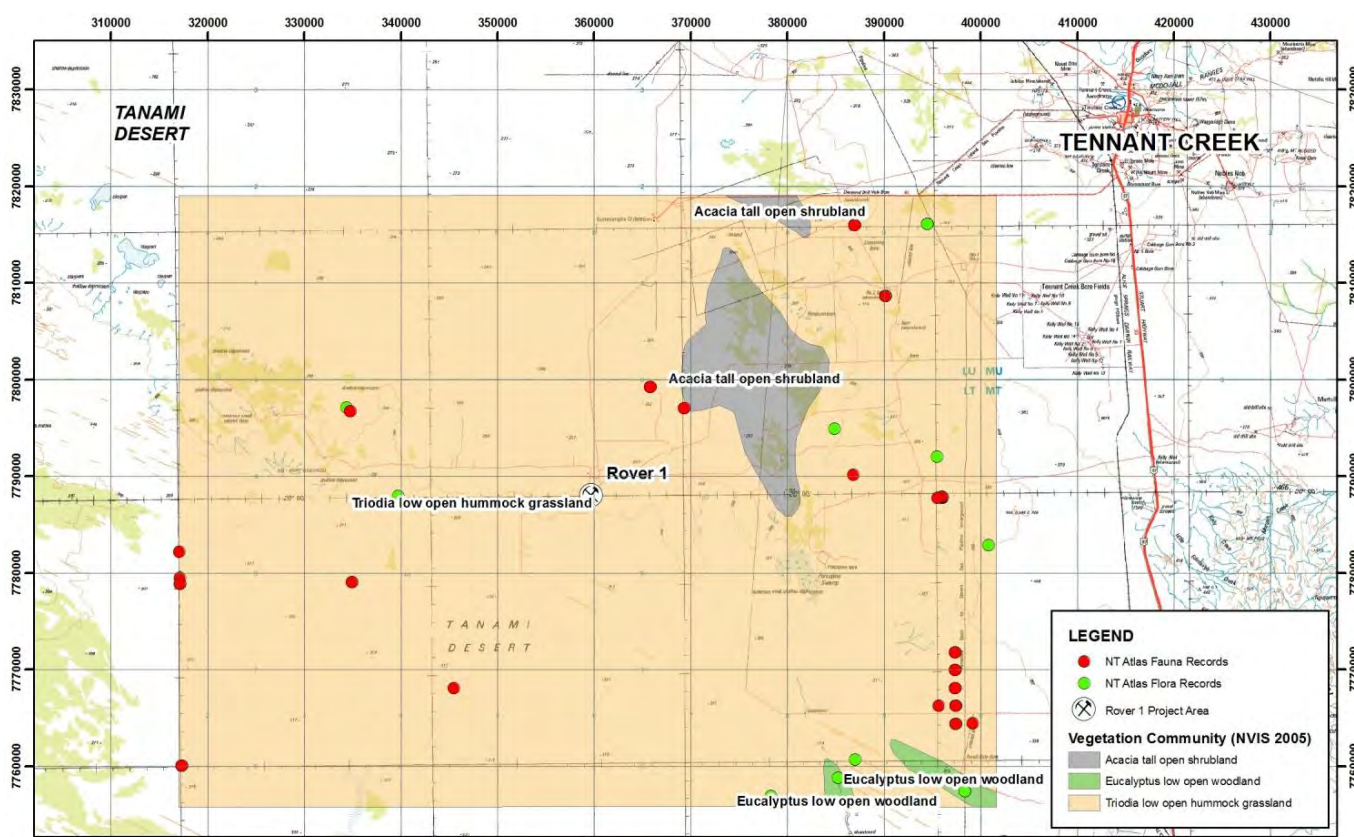


Figure 6: Existing records for the Rover 1 project area and surrounds (Flora & Fauna Atlas data)
(note that square that demarks the NVIS vegetation map is the extent of species database searches)

2.6.3 Existing Flora Records

Only 29 flora species were identified from the NT Flora Atlas, however the NT Herbarium provided a more comprehensive flora list of 384 species for the project area. None of these species are threatened. The combined flora list is provided in Appendix C.

2.6.4 Threatened Species

The International Union for the Conservation of Nature (IUCN) nominates a set of criteria used to identify species at risk to extinction used to define categories of risk (Figure 7).

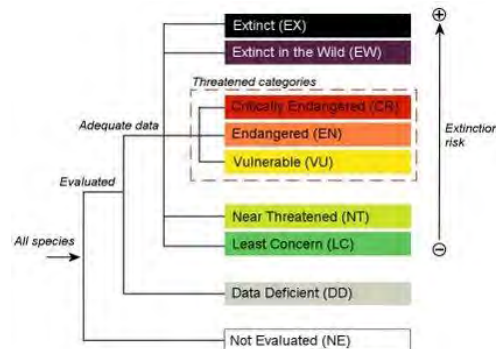


Figure 7: The IUCN Red List of Categories of risk for threatened species

(source: http://www.eoearth.org/article/IUCN_Red_List_Categories_and_Criteria)

These criteria and categories are used by both the NT Government to identify threatened species and habitat which are listed under the *TPWC Act*, and the Federal Government to identify nationally threatened species under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC).

The EPBC Act Protected Matters Search tool (DEHWA, 2010) was used to search an area surrounding the Rover 1 project area (report provided in Appendix A). According to the search results, the Rover 1 project area is not located near any World Heritage Properties, National Heritage Places, Wetlands of International Significance, Commonwealth Marine Areas or Threatened Ecological Communities.

The EPBC search identified five threatened fauna species that could potentially occur within or near the Rover 1 project area (Table 3). Six migratory species were also identified – five of which are unlikely to occur in the project area because of their preference for wetlands, the remaining species – Rainbow Bee-eater, is a common bird species found across most of Australia. One threatened flora species was identified. More detail on threatened species can be found in Section 5.

Table 3: Threatened species that could potentially occur within the Rover 1 project area.

Common Name	Scientific Name	Status (Aus/NT)	Likelihood of Occurrence	Reason
REPTILES				
Great Desert Skink	<i>Egernia kintorei</i>	VU / VU	Likely	Suitable habitat
BIRDS				
Australian Painted Snipe	<i>Rostratula australis</i>	VU / VU	May	Not preferred habitat
Australian Bustard	<i>Ardeotis australis</i>	– / VU	Known	Known in area
Emu	<i>Dromaius novaehollandiae</i>	– / VU	Likely	Suitable habitat
Night Parrot	<i>Pezoporus occidentalis</i>	EN / CR	May	No recent records
MAMMALS				
Black-footed Rock-wallaby	<i>Petrogale lateralis</i>	VU / NT	May	Lack of habitat
Greater Bilby	<i>Macrotis lagotis</i>	VU / VU	Likely	Suitable habitat
Brush-tailed Mulgara	<i>Dasycercus blythi</i>	VU / VU	Likely	Suitable habitat
Southern Marsupial Mole	<i>Notoryctes typhlops</i>	EN / VU	May	Not preferred habitat
PLANTS				
Dwarf Desert Spike-rush	<i>Eleocharis papillosa</i>	VU / VU	May	Lack of habitat

Note: CR – Critically Endangered; EN – Endangered; VU – Vulnerable; NT – Near Threatened.

2.6.5 Introduced Species

Weeds are classified by the Northern Territory Government in terms of their potential environmental impact. These classifications are (as per the NRETAS Website, 2011);

- Class A: To be eradicated
- Class B: Growth and spread to be controlled
- Class C: Not to be introduced to the Territory

The NT Infonet search identified 29 weed species that may be present within the project area and surrounds (Table 4). The EPBC Act Protected Matters search identified two species, both of which were included in the Infonet Search.

Table 4: Weeds that may occur with the Rover 1 project area according to Infonet Search

Common Name	Species	Family	Class
Awnless Barnyard Grass	<i>Echinochloa colona</i>	Poaceae	-
Buffel Grass	<i>Cenchrus ciliaris</i>	Poaceae	-
Caltrop	<i>Tribulus terrestris</i>	Zygophyllaceae	B/C
Camel Melon	<i>Citrullus lanatus</i>	Cucurbitaceae	-
Caribbean Stylo	<i>Stylosanthes hamata</i>	Fabaceae	-
Coffee Bush	<i>Leucaena leucocephala leucocephala</i>	Mimosaceae	-
Coffee Senna	<i>Senna occidentalis</i>	Caesalpiniaceae	B/C
Creeping Wood-sorrel	<i>Oxalis corniculata</i>	Oxalidaceae	-
Elastic Grass	<i>Eragrostis tenuifolia</i>	Poaceae	-
Feathertop Rhodes Grass	<i>Chloris virgata</i>	Poaceae	-
Flannel Weed	<i>Sida cordifolia</i>	Malvaceae	B/C
Gomphrena Weed	<i>Gomphrena celosioides</i>	Amaranthaceae	-
Hyptis	<i>Hyptis suaveolens</i>	Lamiaceae	B/C
Indian Bluegrass	<i>Bothriochloa pertusa</i>	Poaceae	-
Khaki Weed	<i>Alternanthera pungens</i>	Amaranthaceae	B/C
Madagascar Dropseed	<i>Sporobolus coromandelianus</i>	Poaceae	-
Mossman River Grass	<i>Cenchrus echinatus</i>	Poaceae	B/C
Neem	<i>Azadirachta indica</i>	Meliaceae	-
Parkinsonia	<i>Parkinsonia aculeata</i>	Caesalpiniaceae	B/C
Parramatta Grass	<i>Sporobolus africanus</i>	Poaceae	-
Prickly Malvastrum	<i>Malvastrum coromandelianum</i>	Malvaceae	-
Purpletop Chloris	<i>Chloris barbata</i>	Poaceae	-
Red Natal Grass	<i>Melinis repens</i>	Poaceae	-
Rubber Bush	<i>Calotropis procera</i>	Asclepiadaceae	B/C
Sabi grass	<i>Urochloa mosambicensis</i>	Poaceae	-
Siratro	<i>Macroptilium atropurpureum</i>	Fabaceae	-
Spiked Malvastrum	<i>Malvastrum americanum</i>	Malvaceae	-
Spiny-head Sida	<i>Sida acuta</i>	Malvaceae	B/C
Starburr	<i>Acanthospermum hispidum</i>	Asteraceae	B/C

A total of 14 introduced fauna species was identified to possibly occur within the Rover 1 project area according to government database searches (Table 5). The occurrence of several of these species is highly unlikely due to habitat preferences and known species distributions.

Table 5: Introduced Fauna Species that may occur within the Rover 1 project area
(list was derived by the INFONET report – N.T. Government)

Common Name	Species Name	Likelihood of occurring within project area
House Mouse	<i>Mus musculus</i>	Highly Likely
Cat	<i>Felis catus</i>	Highly Likely
Camel	<i>Camelus dromedarius</i>	Highly Likely
Cattle	<i>Bos indicus/Bos taurus</i>	Highly Likely
Rabbit	<i>Oryctolagus cuniculus</i>	Likely
Black Rat	<i>Rattus rattus</i>	Possible
Donkey	<i>Equus asinus</i>	Possible
Horse	<i>Equus caballus</i>	Possible
House Sparrow	<i>Passer domesticus</i>	Unlikely
Eurasian Tree Sparrow	<i>Passer montanus</i>	Unlikely
Fox	<i>Vulpes vulpes</i>	Unlikely
Asian House Gecko	<i>Hemidactylus frenatus</i>	Highly Unlikely
Rock Dove	<i>Columba livia</i>	Highly Unlikely
Swamp Buffalo	<i>Bubalus bubalis</i>	Highly Unlikely

3 Survey Methodology

3.1 Vegetation Surveys

Recent aerial photography was used to inform the visual interpretation of vegetation boundaries within the key focus areas (FASTLOOK imagery provided by client). This preliminary interpretation assisted with selecting survey sites that were used for both flora and fauna studies.

Survey sites for vegetation mapping and habitat characterisation comprised of an area of 25m by 25m. The full range of attributes recorded for a vegetation survey site contributing towards vegetation mapping includes (based on full characterisation sites in Brocklehurst *et al.* 2007):

- **Site location:** GPS coordinates and general description.
- **Habitat information:** Landform pattern and element, vegetation patch size, aspect, slope, surface soil type (broad category only), estimated soil depth, estimated drainage capacity and percentage ground cover for standing biomass, litter, bare earth and pebble/rock/outcrop, presence of fallen logs, mistletoe, flowering plants and termite mounds (and their type).
- **Status of disturbance:** The time since the last fire and scorch height as well as the presence and extent (estimated cover) of weed species and the presence and stability of erosion.
- **Broad Structural information:** The estimated crown separation ratio, the estimated percentage canopy cover or ground cover for the main three vegetation strata and their height range and average height.
- **Floristic and Structural Formation:** For vegetation mapping a full list of species present is compiled along with canopy heights and percentage cover for each species in the strata.

For habitat characterisation and ground-truthing existing land systems mapping the level of data collection aligns with a check site as described in Brocklehurst *et al.* (2007). The above attributes were applied with some exceptions: for the floristic component only the dominant species (i.e. those contributing greater than 5% cover) and their associated cover and height are recorded. For habitat characterisation comments are added to the floristics component to indicate which species are flowering or fruiting.

As recommended by the Northern Territory Guidelines (Brocklehurst *et al.* 2007) estimates for canopy percentage cover is based on the crown being treated as opaque for the upper storey. This approach accommodates for seasonal deciduousness. Percentage cover estimates for the mid and ground strata are assessed using the percentage foliage cover (the percentage of the sample site occupied by vertical projection of foliage and branches).

Landform observations follow Speight (2009) in the Australian Soil and Land Survey Field Handbook (3rd Edition Yellow Book).

Incidental records for weeds and fire were noted in all of survey areas and their surrounds and particular attention was paid to existing road corridors.

Note that “vegetation mapping is not an exact science, but rather an applied science that imposes boundaries on a transition or continuum (often temporal and spatial)” (Brocklehurst *et al.* 2007). To provide some consistency in interpreting vegetation types no more than four observers contributed to completing the vegetation mapping and habitat characterisations.

The species nomenclature for plants follows the Checklist for Vascular Plants for the Northern Territory (Short *et al.* 2011).

3.2 Terrestrial Fauna Survey

Fauna surveys were conducted in order to characterise habitat types and species present within the study areas.

A standard fauna survey and assessment methodology for the Northern Territory southern bioregions was applied with the aim of characterising habitats and their associated species. Applying standard approaches permits some degree of relating species presence with particular habitat types. It also allows for explicit assumptions about the likely diversity present in similar habitats which have not been surveyed, and permits some comparison with surveys conducted in different locations which have also been assessed using the same standard.

The methods for fauna survey (including habitat descriptions) followed the *Northern Territory Survey Methods for Flora and Fauna Surveys Used for Standard Biodiversity Unit Survey Sites* (an unpublished report of NRETAS provided in 2008). This involves a three night trapping and searching program within a 50m by 50m quadrat (or similar are in transect formation). Where possible at two areas of the same habitat type, located at least 500m apart, were surveyed to account for variability with the same 'category' of habitat. This methodology is a standard approach for fauna surveys in the northern bioregions of the Northern Territory. Fauna survey techniques are detailed below.

All surveys were undertaken under Wildlife permit no. 43782.

3.2.1 Site Selection

Six sites were selected for baseline flora and fauna surveys of the Rover 1 project area (see Table 6 and Figure 8). Selection criteria included incorporation of a variety of habitat types within the proposed mine development area, targeting any identified preferred habitat of threatened species that potentially occur in the region. Six survey sites was considered sufficient for the size of the proposed mining development, especially as the vegetation types and habitat condition across the site was relatively homogenous.

Table 6: Survey Site Locations

Site	Coordinates (GDA94, Zone 52)		Rationale for Site Selection
	Easting	Northing	
1	357928	7785814	Close to proposed airstrip. Higher density of small trees compared to other sites.
2	358452	7786471	Within proposed TSF. Open Acacia Shrubland, hummock grasses
3	359192	7786073	Targeted variation in habitat as this site contained <i>Melaleuca lasiandra</i>
4	359210	7787164	Within proposed disturbance area (WRD, Process Plant, box cut, ore stockpiles)
5	360038	7786616	Proposed mine camp
6	360374	7787022	Mulga community (distinctly different vegetation type)

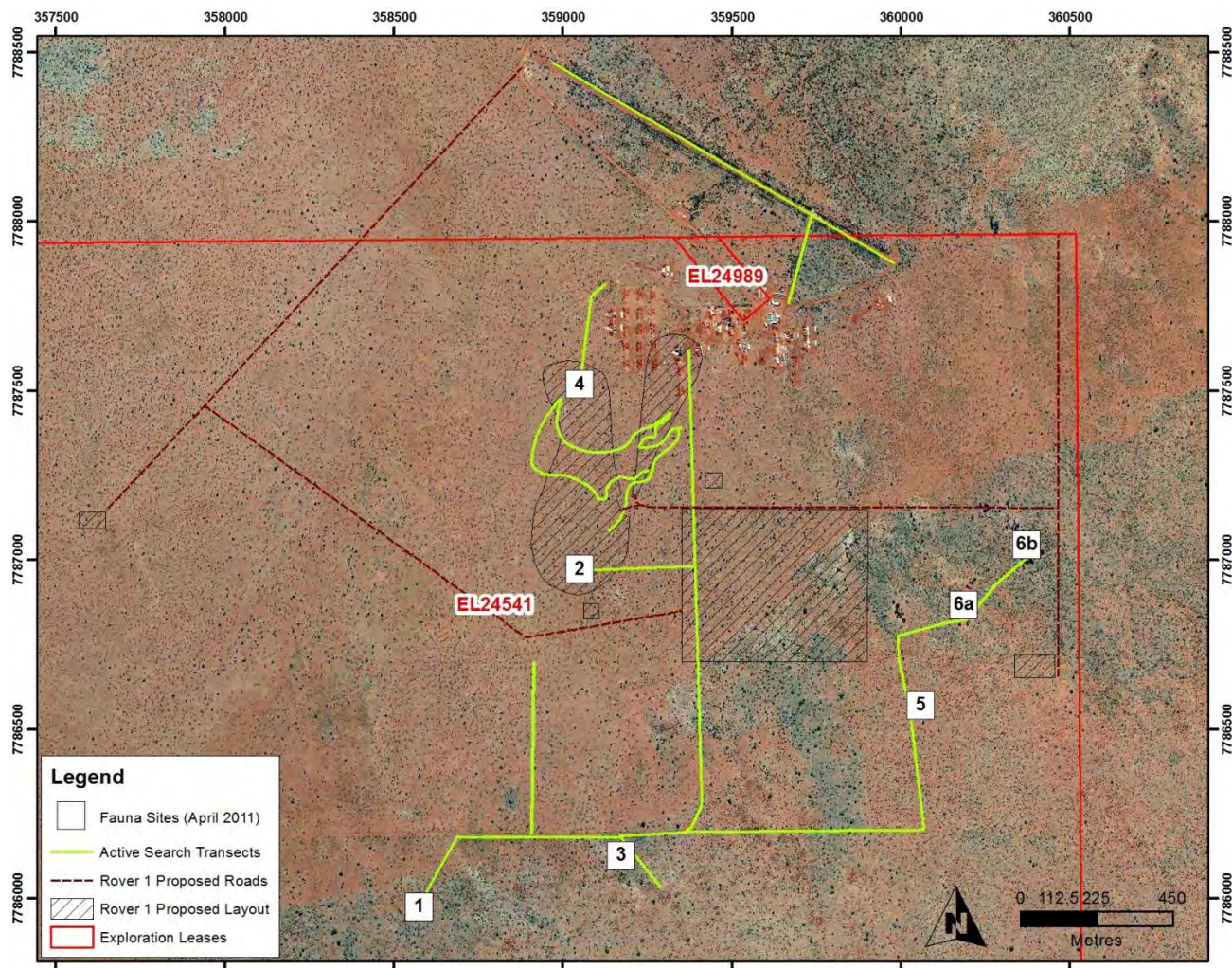


Figure 8: Rover 1 Survey Site Locations and Active Search Transects (April 2011)

3.2.2 Survey Design

Site Layout

The layout of traps at each survey quadrat is based on the standard and accepted NT fauna survey guidelines for the southern bioregions of the NT, this involved:

- 25 Elliott traps in a transect, each trap spaced approximately 8 to 10 m apart (i.e. 250 m long transect)
- 4 Pitfall traps (with 10 m of drift fence) in different microhabitat within the site
- 5 Funnel traps set against pitfall drift fences.

Pitfall traps were 20 L white plastic buckets which were dug to ground level and set with 10 m of drift-fence. Where possible, the pits were located across different microhabitats within the quadrat. Funnel traps were set on the end of the drift fence. Silver reflective thermafoil (roof insulation) were set over pits and funnel traps to protect animals from dehydration and predation from raptors. The pits and funnels were opened for 3 nights and 3 days, checked early each morning and rechecked in the mid afternoon.

The Elliott traps were baited each afternoon, opened overnight, and closed for the duration of the day. The bait was a mixture of quick oats, peanut butter, honey and sardines in oil.

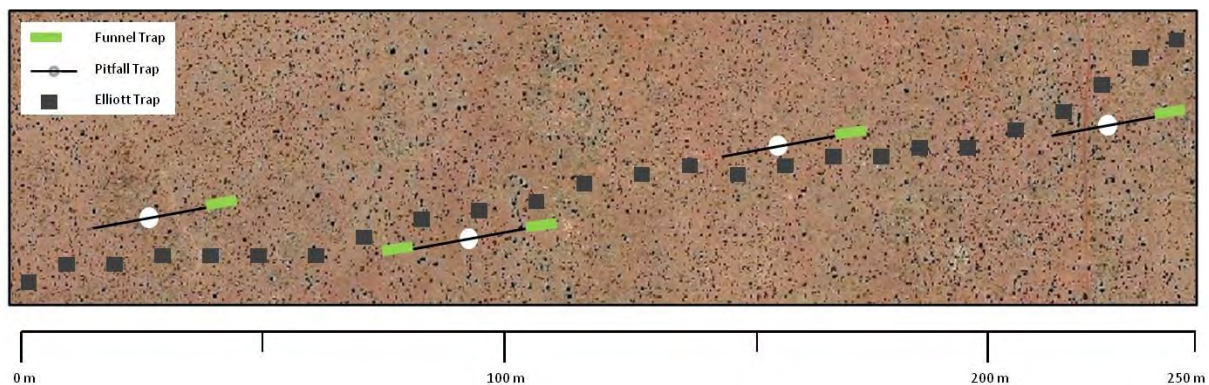


Figure 9: Typical fauna trap layout plan (southern NT bioregions)

All trapped animals were identified and released near the capture point. There was no need to mark captured animals because the purpose of this survey was to investigate species diversity rather than population size. A DNA sample (small ear clipping) was collected for each mammal capture, and samples were provided to NRETAS Biodiversity Unit for their purposes (DNA library).

Bird Survey

Bird species were counted in a 100 m x 250 m quadrat around each transect. Each site was surveyed on six occasions during daylight hours. Bird counts were generally conducted during early morning and late afternoon (corresponding with times of higher bird activity), with a few counts spaced throughout the day. Each count was considered an instantaneous count of species within the quadrat, not abundance, and involved viewing the quadrat for five minutes. Birds that were noted outside of the time of bird count, or outside the quadrats, were noted as incidentals observations and therefore not recorded to site. Only birds using the quadrat were attributed to site records, as birds merely flying across or overhead were incidentals. Raptors were included if they were hunting overhead.

Bat Survey

Bats were surveyed using an Anabat II Bat Detector. The Anabat was used at all sites during spotlighting activities, and was left to record overnight at the Rover 1 exploration camp for three nights.

Kyle Armstrong from *Specialised Zoological* was contracted to analyse the resulting bat call sequences and provide a summary report noting bat species presence.

Anabat results can provide a reasonable indication of species presence, physically trapping the bats was not necessary for this survey.

Active Searching

Survey sites were actively searched five times for reptiles, mammals, and their scats and signs, including three daytime searches (morning, midday, and late afternoon) and two nocturnal searches.

Active searches lasted for 20 minutes and involved:

- Turning rocks and logs, raking through leaf litter and grass, looking under bark, behind trees, in crevices, etc.;
- Searches for burrows, pop-holes, particularly those with freshly excavated earth, tracks and scats;
- Recording the number of individuals of each species;
- Recording scats, bones and other signs where they could be confidently attributed to species; and
- Spot-lighting at night looking for 'eye-shine'.

Opportunistic observations made while travelling between quadrats were also recorded in an 'incidentals' list.

Habitat Description

The habitat for each fauna survey site was described using a range of data (aligning to both NVIS and NRETAS Standards for Biodiversity Assessment).

Nomenclature

Nomenclature and classification of fauna species refers to the Classification of Wildlife of the NT – January 2007 (NRETAS). At the time of writing this report the Northern Territory listings of threatened species was under review and at the stage of seeking public comment.

Data Limitations

- The results of these surveys are only a snapshot in time, and do not allow for temporal variations or species migrations;
- Sampling, as against censussing, is logistically necessary due to limited human resources. Moreover, a larger degree of sampling is required to account for all the above mentioned variations with a high level of confidence;
- Sampling is logistically necessity due to resources – can never capture the full range of variations.
- Scats cannot always be correctly attributed to species, however where they can be confidently identified, they provide an accurate indication of the presence and habitat preferences of certain species (Telfer *et al.* 2006);
- Detection of nocturnal species by spotlight potentially only detects about 25% of the animals present (e.g. Goldingay & Sharpe 2004), and is affected by environmental factors (Wayne *et al.* 2005). Specific survey conditions can be selected to improve spotlight detection efficiency (Wayne *et al.* 2005);
- Read & Moseby (2001) concluded that environmental factors affect capture rates. Unfortunately, planning logistics for fauna surveys such as this around specific environmental conditions is very difficult. Planning to survey in the Dry season allows the best chance of favourable conditions;
- The trapping and search methodologies utilised in this study predominantly targeted only threatened species identified during desktop surveys and therefore did not necessarily provide an unbiased or complete indication of species diversity within an area or allow for other threatened species not identified on the database (Moseby & Read 2001; Cunningham *et al.* 2005; Thompson *et al.* 2005);
- Fauna and Flora Atlas records are biased toward previous NT Government survey sites and accessible sites often recognised for their unique biodiversity. Therefore, a lack of records at any particular site is more likely to indicate that the area has not been previously surveyed rather than indicate that various species are not present in the area.

3.3 Targeted Surveys for Threatened Species

Five threatened species are identified from desktop searches as being likely or known to be present in the survey area. Of these, the two bird species are conspicuous and should be observed if present. As such no targeted survey techniques are required. For the Great Desert Skink (*Egernia kintorei*), according to the *Survey Guidelines for Australia's Threatened Reptiles* (DSEWPaC, 2011a) the most appropriate survey technique is to locate burrow systems, as per the active-searching techniques described above. For the remaining two threatened mammal species – Greater Bilby (*Macrotis lagotis*) and Brush-tailed Mulgara (*Dasycercus blythi*) – the survey techniques recommended in the *Survey Guidelines for Australia's Threatened Mammals* (DSEWPaC, 2011b) to detect their presence comprises, for the most part, the standard trapping and active searching regime as described above. If warrens were located (which they were not) a motion detector camera would have been setup for several nights to records any fauna activity (both Mulgara and Bilbies are easy to identify from photographs).

Climatic conditions of the April 2011 survey were perfect for small mammal trapping with previous summer rainfall producing good vegetation growth which resulted in a boom in small mammal species. Trapping was very successful with high capture rates for Spinifex Hopping Mouse, Desert Mouse, and Sandy Inland Mouse. Many tracks were visible and in good condition during the surveys, however *D. blythi* tracks were not identified despite the good condition in the locality.

Surveys were conducted by experience ecologists that have experience in identifying *M. lagotis* sign. Survey team leader, Tom Reilly, has experience in identifying *M. lagotis* in the Tanami Desert having previously worked for Dr Bill Low of Low Ecological Services. Signs of *M. lagotis* were also searched for during an archaeological assessment of the box cut and waste rock dump footprint by Tim Hill who is experienced in *M. lagotis* sign identification.

4 Survey Results

4.1 Vegetation Survey

The vegetation of the Rover 1 project area is predominantly Soft Spinifex (*Triodia pungens*) hummock grassland with Acacia tall sparse-shrubland overstorey (Map Unit 76 in Wilson *et al.* 1990). There are a few patches where Curly Spinifex (*Plectrachne schinzii*) becomes the dominant ground-cover, however, *Triodia pungens* has a more extensive coverage across the Rover 1 project area. The overstorey is mainly Dogwood (*Acacia coriacea*) (reaching a height of 4 to 5 m) with most areas supporting isolated Desert Bloodwood trees (*Corymbia opaca*).

There are several floristic variations in this vegetation type at Rover 1. The main variations are associated with the dominant mid storey species, with some areas supporting high coverage of *Acacia lysiphloia*, *Acacia ancistrocarpa*, *Melaleuca lasiandra*, *Senna* spp, *Gossypium australe*, and also some large scattered Ghost Gum trees (*Corymbia aparrarinja*). The ground layer species had a fairly consistent pattern across the project area with several graminoid species (mainly consisting of *Eragrostis eriopoda*, *Aristida* spp, *Iseilema vaginiflorum*, and *Paraneurachne muelleri*) and a relatively high diversity and coverage of forbs due to recent rainfall conditions (including *Scaevola parvifolia*, *Scaevola ovaliflora*, *Tephrosia* spp., *Corchorus sidoides*, *Goodenia armitiana*, *Euphorbia tannensis*, *Tinospora smilacina*, *Mukia maderasparata*, *Indigofera linifolia*, *Ptilotus* spp, *Abutilon otocarpum*, *Goodenia armitiana*).

One other distinct vegetation community was identified within the Rover 1 project area – *Acacia aneura* (Mulga) tall open shrubland with *Eragrostis eriopoda* (Woolly Butt) open-grassland understorey (Map Unit 65 in Wilson *et al.* 1990). These patches were also associated with minor depressions that supported dense *Eulalia aurea* grass. There were only a few small isolated patches/groves of this vegetation type within the project area, both located close to the north eastern boundary, approximately 500m from the proposed mine camp.

These vegetation types and floristic variations were mapped as part of this assessment to an approximate scale of 1:10,000 (see Figure 10). Hummock Grasslands with sparse Acacia tall shrubland covered approximately 98% of the proposed ELR boundary (Rover 1 project area). The remaining 2% was Mulga Tall Shrubland.

Sixty-four flora species were identified during the survey; all regionally common species (see Appendix D).

No threatened flora species were identified during the surveys.

No listed weeds were identified in the survey sites or other exploration tracks during the survey. However, disturbance plants and pioneer species (especially Tumbleweed *Salsola tragus*) were observed in cleared areas surrounding the current exploration camp. These species are only problematic during rehabilitation practices as they out-compete more ideal species. Currently, they are serving a soil conservation purpose (i.e. inhibiting erosion).

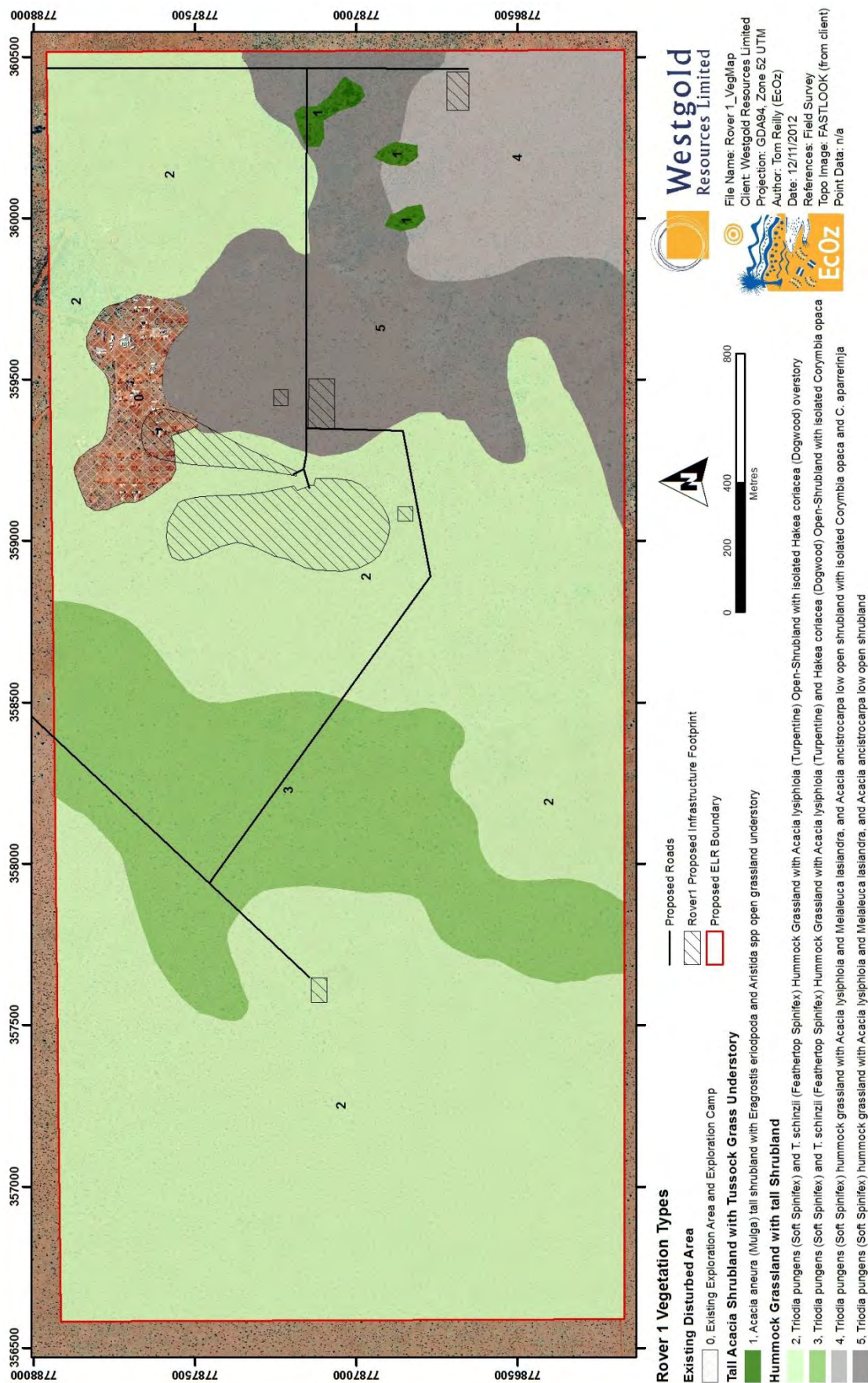


Figure 10: Rover 1 Vegetation Map (approximate scale of 1:10,000)

4.2 Survey Site Descriptions

Site 1 – Open Acacia Shrubland (*A. coriacea*) over hummock grasses (*T. pungens*) & forbs



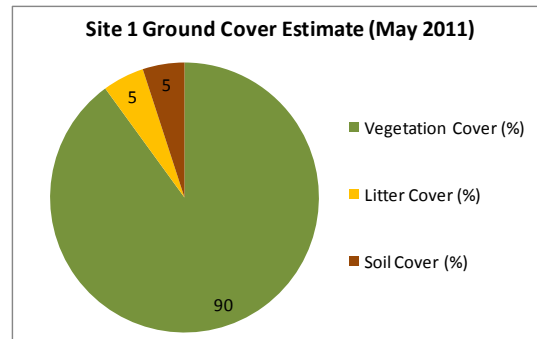
Site 1 – Open Acacia Shrubland (*A. coriacea*) over hummock grasses (*T. pungens*) & forbs

Site Location: Site 1 is situated in the southwest corner of the Rover 1 project area (E357928, N7785814 Zone 53). The site is located 400m west of the proposed airstrip, and 400m south of the proposed tailings storage facility.

Landform: Flat sand plain with red sandy soils, with a deep profile. The soil is relatively porous and does not show sign of seasonal waterlogging (i.e. rapid drainage due to sandy soils rather than steep slopes).

Vegetation: Site 1 is part of an extensive patch of open acacia shrubland with a dense shrub layer of Turpentine Bush (*Acacia lysiphloia*) and Soft Spinifex (*Triodia pungens*) understorey.

Groundcover at the site was very high with a total of 95% (see graph to the right). Vegetation cover at the site was very high estimated at 90% total cover. Litter cover was estimated at 5 to 10% and bare ground was 5%. No rocks or gravel were present. No cryptogam or crusting present.



A total of 21 flora species were recorded, all common species for this type of vegetation community.

The upper stratum (<5% cover, average height of 5 metres) consisted of three (3) species, and was dominated by Dogwood (*Acacia coriacea*). Bloodwood trees (*Corymbia opaca*) were scattered, and Flat-leaved Hakea's (*Hakea macrocarpa*) was present in low numbers.

The mid stratum (65% cover, average height of 1.5 metres) consisted of seven (7) species, with Turpentine Wattle (*Acacia lysiphloia*) being dominant at the site. Other mid stratum species included *Acacia ancistrocarpa*, *Acacia adsurgens*, *Gossypium australe*, *Senna artemisioides oligophylla*, *Senna artemisioides helmsii*, and *Eremophila latrobei*.

The ground stratum (60% cover, average height of 0.5 metres) consisted of ten (10) species, with Soft Spinifex (*Triodia pungens*) being dominant. Other ground stratum species included *Scaevola parvifolia*, *Scaevola ovalifolia*, *Aristida inaequiglumis*, *Gossypium australe*, *Iseilema vaginiflorum*, *Corchorus sidoides*, *Indigofera georgei*, *Paraneurachne muelleri*, *Enneapogon polyphyllus*, *Cullen sp.*, and unidentified legumes.

Habitat Features: The larger Dogwood (*Acacia coriacea*) and Bloodwood (*Corymbia opaca*) trees within the site featured small hollows and bark shelter, but no larger fallen logs were present.

Dogwood, Bloodwood, and Turpentine Wattle (amongst many other smaller herb species were in full bloom) which attracted several species of honeyeaters. *Triodia pungens* and other graminoids (including *Aristida* spp. and *Paraneurachne muelleri*) had either seeded or are currently seeding.

Mistletoe *Lysiana exocarpi* (not flowering at the time) was scattered throughout the site, and mainly occurred on larger Bloodwoods and Dogwoods.

Termite mounds were sparsely distributed (i.e. only 4 small tower mounds were recorded) and did not exceed 50cm. Leaf litter was shallow (~50mm) and was generally confined to the canopy of Bloodwood trees.

Disturbances: The survey did not record any evidence of feral animals, weeds, erosion, or recent fire. A single lane 4WD exploration track that was used to access the site is located approximately 400m to the north of the site.

Site 2 – Open Acacia Shrubland (*A. coriacea*) over hummock grasses (*T. pungens*)



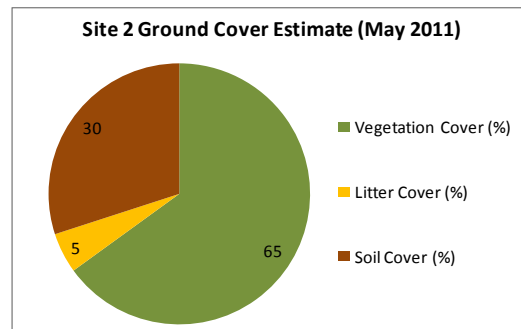
Site 2 – Open Acacia Shrubland (*A. coriacea*) over hummock grasses (*T. pungens*)

Site Location: Site 2 is situated in the central western portion of the Rover 1 project area (E358928, N7786471 Zone 53). The site is located within the proposed tailings storage facility.

Landform: Flat sand plain with red sandy soils, with a deep profile. The soil is relatively porous and does not show sign of seasonal waterlogging (i.e. rapid drainage due to sandy soils rather than steep slopes).

Vegetation: Site 2 is part of an extensive patch of low open acacia shrubland with a Soft Spinifex (*T. pungens*) understorey with patches of Feathertop Spinifex (*T. schinzii*). A total of 21 flora species were recorded.

Groundcover at the site was very high with a total of 70% (see graph to the right). Vegetation cover at the site was high estimated at 65% total cover. Litter cover was estimated at 5 % and bare ground was 30%. No rocks or gravel were present.



The upper stratum (<5% cover, average height of 5 metres) consisted of two (2) species, and was dominated by Dogwood (*Acacia coriacea*) with scattered Bloodwood trees (*Corymbia opaca*).

The mid stratum was relatively sparse (10% cover, average height of 2 metres) and consisted of five (5) species, with Turpentine Wattle (*Acacia lysiphloia*) and small Dogwoods (*A. coriacea*) being dominant. The only other mid stratum species recorded were *Gossypium australe*, *Senna artemisioides oligophylla*, and *Jasminum calcareum*.

The ground stratum was relatively diverse and consisted of seventeen (17) species, with Soft Spinifex (*Triodia pungens*) being dominant (60% cover, average height of 0.5 metres). Other ground stratum species included *Triodia schinzii*, *Scaevola parvifolia*, *Scaevola ovalifolia*, *Gossypium australe*, *Solanum ellipticum*, *Iseilema vaginiflorum*, *Aristida latifolia*, *Aristida holothera*, *Aristida inaequiglumis*, *Paraneurachne muelleri*, *Eragrostis eriopoda*, *Goodenia armitiana*, *Corchorus sidoides*, *Indigofera linifolia*, *Macgregoria racemigera*.

Habitat Features: The larger Dogwood (*Acacia coriacea*) and Bloodwood (*Corymbia opaca*) trees within the site featured small hollows and bark shelter. Spotlighting at this site did not detect any arboreal species (i.e. Spiny-tailed Geckos *Strophurus ciliaris*). Fallen logs were absent.

Dogwood, Bloodwood, and Turpentine Wattle (amongst many other smaller herb species) were in full bloom, however honeyeater records were low at this site. *Triodia pungens* and other graminoids (including *Aristida* spp. and *Paraneurachne muelleri*) had either seeded or are currently seeding, therefore providing plentiful food resource for many small mammal species.

Mistletoe was absent at this site.

Termite mounds were sparsely distributed and did not exceed 50cm.

Leaf litter was shallow (~50mm) and was generally confined to the canopy of Dogwoods and Bloodwoods.

Disturbances: The survey did not record any evidence of feral animals, weeds, erosion, or recent fire. A single lane 4WD exploration track that was used to access the site is located approximately 500m to the south of the site.

Site 3 – Mixed Acacia Shrubland with *Melaleuca lasiandra* over hummock grasses



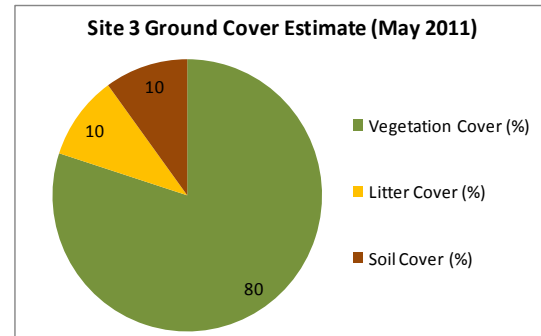
Site 3 – Mixed Acacia Shrubland with *Melaleuca lasiandra* over hummock grasses

Site Location: Site 3 is situated in the central southern portion of the Rover 1 project area (E357192, N7786073 Zone 53). The site is located adjacent to the proposed borrow pit.

Landform: Flat sand plain with red sandy soils, with a deep profile. The soil is relatively porous and does not show sign of seasonal waterlogging (i.e. rapid drainage due to sandy soils rather than steep slopes). No rocks or gravel were present.

Vegetation: Site 3 is part of an extensive patch of low open acacia shrubland with a Soft Spinifex (*Triodia pungens*) understorey. A total of 20 flora species were recorded.

Groundcover at the site was very high with a total of 90% (see graph to the right). Vegetation cover at the site was very high estimated at 80% total cover. Litter cover was estimated at 10% and bare ground was 10%. No rocks or gravel were present.



The upper stratum is absent at this site. Isolated Bloodwood (*Corymbia opaca*) and Ghost Gum (*Corymbia apparejia*) trees were present in the area but did not fall within the survey quadrat.

The mid stratum (40% cover, average height of 2.5 metres) consisted of six (6) species, with Turpentine Wattle (*Acacia lysiphloia*) and Fitzroy Wattle (*Acacia ancistrocarpa*) being dominant at the site. Other mid stratum species included *Acacia coriacea*, *Melaleuca lasiandra*, *Senna artemisioides oligophylla*, and *Eremophila latrobei*.

The ground stratum (80% cover, average height of 0.5 metres) consisted of thirteen (13) species, with Soft Spinifex (*Triodia pungens*) being dominant. Other ground stratum species included *Gossypium australe*, *Scaevola parvifolia*, *Corchorus sidoides*, *Indigofera linifolia*, *Indigofera georgei*, *Aristida inaequiglumis*, *Aristida holothera*, *Iseilema vaginiflorum*, *Eragrostis eriopoda*, *Macgregoria racemigera*, *Tephrosia* sp.

Habitat Features: There were no hollows within this site. Spotlighting at this site did not detect any arboreal species (i.e. Spiny-tailed Geckos *Strophurus ciliaris*). Fallen logs were absent. The large Ghost Gums (*Corymbia apparejia*) located outside of the official survey plot were inspected during nocturnal searches and found relatively fresh claw scratches on the smooth trunk (i.e. likely to be Black-headed Monitor *Varanus tristis*).

Melaleuca lasiandra, *Acacia lysiphloia*, and *Acacia ancistrocarpa* (amongst many other smaller herb species) were in full bloom, which produced high honeyeater counts at this site. *Melaleuca lasiandra* (Sand Hill Tea Tree) was especially spectacular. Graminoids at this location had either seeded or are currently seeding, therefore providing plentiful food resource for many small mammal species.

Mistletoe was absent at this site. Termite mounds were absent.

Leaf litter was shallow and was generally made of Fitzroy Wattle leaf debris.

Disturbances: The survey did not record any evidence of feral animals, weeds, erosion, or recent fire. A single lane 4WD exploration track that was used to access the site is located approximately 50 m to the north of the site.

Site 4 – Open Acacia Shrubland over hummock grasses



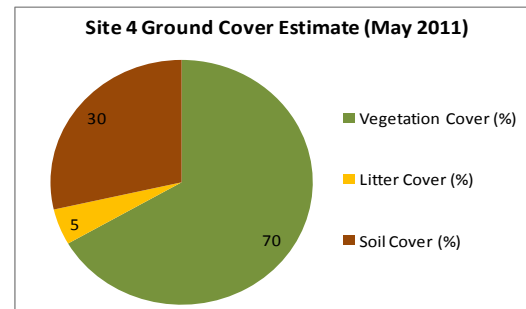
Site 4 – Open Acacia Shrubland over hummock grasses

Site Location: Site 4 was located within the area proposed for the decline box cut and Waste Rock Dump (E359210, N7787164 Zone 53).

Landform: Flat sand plain with red sandy soils, with a deep profile. The soil is relatively porous and does not show sign of seasonal waterlogging (i.e. rapid drainage due to sandy soils rather than steep slopes). No rocks or gravel were present.

Vegetation: Site 4 is part of an extensive patch of low open acacia woodland with a Soft Spinifex understorey. A total of 27 flora species were recorded.

Groundcover at the site was high with a total of 70% (see graph to the right). Vegetation cover at the site was estimated at 70% total cover. Litter cover was estimated at 5% and bare ground was 30%. No rocks or gravel were present.



The upper stratum (<5% cover, average height of 5 metres) consisted of two (2) species, consisting of Dogwood (*Acacia coriacea*) and Bloodwood trees (*Corymbia opaca*).

The mid stratum (40% cover, average height of 2 metres) consisted of eight (8) species, with Turpentine Wattle (*Acacia lysiphloia*) being dominant at the site. Other mid stratum species included *Acacia ancistrocarpa*, *Acacia coriacea*, *Acacia adsurgens*, *Gossypium australe*, *Senna artemisioides oligophylla*, *Eremophila longifolia*, *Melaleuca lasiandra*.

The ground stratum (70% cover, average height of 0.5 metres) consisted of fourteen (14) species, with Soft Spinifex (*Triodia pungens*) being dominant. Other ground stratum species included *Scaevola parvifolia*, *Scaevola ovalifolia*, *Corchorus sidoides*, *Macgregoria racemigera*, *Aristida holathera*, *Eragrostis eriopoda*, *Iseilema vaginiflorum*, *Dicrastylis excruciosa*, *Ptilotus calostachyus*, *Mukia maderasparata*, *Keraudrinia nephrosperma*, *Indigofera linifolia*, *Tephrosia sp.*, *Cullen sp.*, *Sida sp.*, *Bonamia erecta*.

Habitat Features: The larger Dogwood (*Acacia coriacea*) and Bloodwood (*Corymbia opaca*) trees within the site featured small hollows and bark shelter. Spotlighting at this site detected sub-arboreal species such as Spiny-tailed Geckos *Strophurus ciliaris* and Dwarf Bearded Dragons *Pogona minor*. Fallen logs were not common.

Dogwood, Bloodwood, Sand Hill Tea Tree, and Turpentine Wattle (amongst many other smaller herb species) were in full bloom, attracting many honeyeaters. Graminoids had either seeded or are currently seeding, therefore providing plentiful food resource for many small mammal species.

Mistletoe was absent at this site. Termite mounds were sparsely distributed and did not exceed 50cm.

Leaf litter was shallow (<50mm) and was generally confined to the canopy of Dogwoods and Bloodwoods.

Disturbances: The survey did not record any evidence of feral animals, weeds, erosion, or recent fire. An exploration track that was used to access the site is located approximately 50 m from the site. Exploration drilling was being conducted about 400m to the east of the site (which produced constant noise pollution during the day).

Site 5 – Hummock Grasses (*T. pungens* & *T. schinzii*) with Acacia and *Melaleuca lasiandra*



Site 5 – Hummock Grasses (*T. pungens* & *T. schinzii*) with *Acacia* and *Melaleuca lasiandra*

Site Location: Site 5 is situated in the central eastern portion of the Rover 1 project area (E360038, N7786616 Zone 53). The site is located within the proposed mine camp.

Landform: Flat sand plain with red sandy soils, with a deep profile. The soil is relatively porous and does not show sign of seasonal waterlogging (i.e. rapid drainage due to sandy soils rather than steep slopes). No rocks or gravel were present.

Vegetation: Site 5 is part of an extensive patch of low open acacia shrubland with a Soft Spinifex (*Triodia pungens*) understorey. A total of 23 flora species were recorded.

Groundcover at the site was high with a estimated cover of 60% (see graph to the right). Vegetation cover at the site was 60% total cover. Litter cover was estimated at 5% and bare ground was 40%. No rocks or gravel were present.

The upper stratum is absent at this site.

The mid stratum (10 to 15% cover, average height of 2.5 metres) consisted of eight (8) species, with Turpentine Wattle (*Acacia lysiphloia*) and Sand Hill Tea Tree (*Melaleuca lasiandra*) being dominant. Other mid stratum species included *Acacia coriacea*, *Acacia ancistrocarpa*, *Gossypium australe*, *Senna artemisioides oligophylla*, *Senna artemisioides helmsii*, and *Eremophila latrobei*.

The ground stratum (60% cover, average height of 0.5 metres) consisted of thirteen (13) species, with Soft Spinifex (*Triodia pungens*) being dominant. Other ground stratum species included *Goodenia armitiana*, *Indigofera georgei*, *Indigofera linifolia*, *Eragrostis eriopoda*, *Aristida holathera*, *Aristida latifolia*, *Aristida contortus*, *Ptilotus calostachyus*, *Macgregoria racemigera*, *Solanum ellipticum*, *Senna notabilis*, *Tephrosia sp.*

Habitat Features: Upper stratum was absent so no tree hollows were present. Spotlighting at this site detected Spiny-tailed Geckos *Strophurus ciliaris*. No fallen logs were observed.

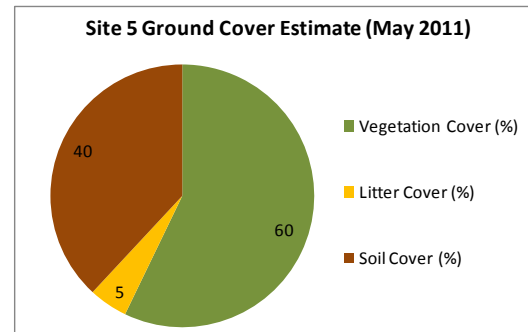
Dogwood, Sand Hill Tea Tree and Turpentine Wattle (amongst many other smaller herb species) were in full bloom, attracting many honeyeaters. Graminoids had either seeded or are currently seeding, therefore providing plentiful food resource for many small mammal species.

Mistletoe and Termite mounds were absent at this site.

Leaf litter was shallow (<50mm) and was generally confined to the canopy of *Acacia* and *Melaleuca* shrubs.

Insect activity was high (i.e. mainly ants, spiders, and a few scorpions).

Disturbances: The survey did not record any evidence of feral animals, weeds, erosion, or recent fire. No vehicle tracks were within 500m of this site.



Site 6 – Mulga Woodland (*Acacia aneura*) over graminoid grasses (*Eragrostis* spp.)



Site 6 – Mulga (*Acacia aneura*) tall open shrubland over graminoid grasses (*Eragrostis* spp.)

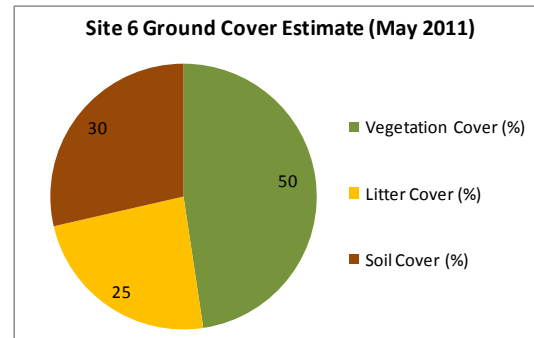
Site Location: Site 6 is situated in the north eastern corner of the Rover 1 project area (E3603748, N7787022 Zone 53). The site is located within the proposed tailings storage facility. This site surveyed two small groves of Mulga (*Acacia aneura*) located to the north of the proposed mine camp.

Landform: Minor depression with red sandy soils, with a deep profile. Soils were heavier than the surrounding sand plain country, typical of Mulga communities (higher clay content). The soils at the site show sign of seasonal waterlogging and may be prone to occasional waterlogging. Silky Browntop Grass (*Eulalia aurea*) was present in several minor depressions within the site, which provides evidence that soils at the site retain water for long periods after rainfall. No rocks or gravel were present.

Vegetation: Site 6 includes two small groves of Mulga (*Acacia aneura*), that are probably outliers of large tracts of Mulga located to the east.

A total of 27 flora species were recorded.

Groundcover at the site was estimated at 75% (see graph to the right). Vegetation cover at the site was 50% total cover. Litter cover was estimated at 25% (made up of Mulga phyllodes) and bare ground was 30% (patchy, located between clusters of Mulga). No rocks or gravel were present.



The upper stratum (50% cover, average height of 7 metres) consisted solely of Mulga (*Acacia aneura*).

The mid stratum (5% cover, average height of 1.5 metres) consisted of six (6) species, most of which occurred on the edge of the grove. No species were regarded as dominant within the mid stratum. Species included *Senna artemisioides oligophylla*, *Senna artemisioides helmsii*, *Melaleuca lasiandra*, *Acacia lysiphloia*, *Eremophila latrobei*, and *Eremophila longifolia*.

The ground stratum was low within the grove compared to the surrounding sandplain vegetation (30% cover, average height of 0.5 metres). Fifteen (15) species were identified with no dominant species present. Species included *Triodia pungens*, *Pterocaulon sphacelatum*, *Aristida holothera*, *Aristida contortus*, *Senna notabilis*, *Paraneurachne muelleri*, *Gossypium australe*, *Eragrostis eriopoda*, *Eulalia aurea*, *Mukia maderaspatana*, *Iseilema vaginiflorum*, *Boerhavia coccinea*, *Sida fibulifera*, *Bulbostylis barbata*, *Scaevola ovalifolia*, *Indigofera linifolia*, *Abutilon otocarpum*, *Corchorus sidoides*, *Polycarpha sp.*

Habitat Features: The small grove of Mulga contained some old trees that provided cracks and crevices for tree goannas such as the Pygmy Mulga Monitor (*Varanus gilleni*), which was spotted on the 3rd day of the survey. Spotlighting also detected Spiny-tailed Geckos *Strophurus ciliaris*. There were several old fallen logs that provide good habitat and shelter for a range of reptiles and small mammals. These groves are often good shelter for macropod species, however no evidence was detected during the survey.

Mulga was in its final stages of flowering, and Sand Hill Tea Tree and *Eremophila* spp (amongst many other smaller herb species) were also flowering. Graminoids had either seeded or are currently seeding, therefore providing plentiful food resource for many small mammal species.

Mistletoe and Termite mounds were absent at this site.

Leaf litter was fairly abundant at the site with an estimated cover of 25% and was confined to the canopy of Mulga trees.

Insect activity was high (i.e. mainly bees, flies, ants, spiders, and a few scorpions).

Disturbances: The survey did not record any evidence of feral animals, weeds, erosion, human impact or recent fire.

4.3 Terrestrial Fauna Survey

4.3.1 Overview

The survey recorded a total of 76 native fauna species, comprising of 20 reptiles, 48 birds, and 8 mammals. Four introduced species were identified. The majority of these species were identified through trapping, active search techniques, and incidental observations. Species lists are provided in the sections below, and site-specific data is provided in Appendix E.

The high summer rainfall weather conditions in the months leading up to the survey resulted in a vegetation boom across the site, and many grasses, forbs, shrubs and trees have seeded and fruited providing plentiful resources to a wide variety of fauna species. The weather conditions during the survey were warm dry days with cold nights (temperature range of 14 to 29 C), which probably reduced nocturnal reptile activity.

The majority of species recorded during the survey are common and generally widespread throughout similar habitat within central Australia. One threatened species was identified during the survey, which was the Australian Bustard (Vulnerable under the *TPWC Act 2000*). No species listed as threatened or migratory under the *EPBC Act 1999* were identified.

A selection of fauna photographs collected during the survey is provided in Appendix G. The sub-sections below list the species identified during the survey, and includes species status, identification method, and approximate abundance during the survey.

4.3.2 Trap Success

From a total of 450 Elliott trap nights, the survey resulted in 57 captures (12.67% Elliott trap success) (Table 6). This is a relatively high trap success for Elliott traps, due to an irruption in two small mammal species from the Muridae family (*Notomys alexis* and *Pseudomys desertor*). Site 2 produced the highest Elliott trap success of 21%. Pitfalls were also very successful with a total of 33% trap success, and caught the greatest diversity of species including mammals and reptiles. Funnels traps had an average success rate (13.3%).

Table 7: Trap Success Statistics

Trap Type	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Total Captures	Trap Nights	Trap Success (%)
Elliotts	11	16	8	6	14	2	57	450	12.7%
Pitfalls	3	3	6	3	4	5	24	72	33.3%
Funnel	3	0	3	4	2	0	12	90	13.3%

4.3.3 Amphibians

No amphibians were identified during the survey. However, it is likely that several frog species exist in the project area and were not active at the time of the survey. Many arid species are burrowers and therefore cannot be identified at these times. Giant Frogs (*Litoria australis*) and Northern Burrowing Frog (*Neobatrachus aquilonius*) have been found in the area according to NT Atlas records and could occur within Rover 1 project area if surveys were conducted when this species is active. No water occur within the project area, and therefore we suspect that amphibian numbers would be low at this site, even during ideal weather conditions.

4.3.4 Reptiles

A total of 20 native reptiles were recorded from the survey, mainly from pit traps and active searches (Table 8). No threatened species were identified. No introduced species were identified. Some species were identified through discussions with drillers on site or skins located in the field.

Six dragon species (family Agamidae) were identified during the survey and were the most common reptile group active throughout the lease area during the survey, particularly the Military Dragons (*Ctenophorus isolepis*). Military Dragons were not caught regularly in traps but were mainly observed basking along road sides. Two Dwarf bearded dragons (*Pogona minor*) were found perched on Dogwood trees during nocturnal search activities. Central Netted Dragons (*Ctenophorus nuchalis*) and Long-nose Dragons (*Lophognathus longirostris*) were also moderately active.

Three skink species (family Scincidae) were identified during the survey, all being from the genus *Ctenotus*. The Panther Skink (*C. pantherinus*) was the most active skink species during the survey with a total of 13 captures. The exploration drillers also mentioned that they often see Centralian Blue tongue Lizards (*Tiliqua multifasciata*) on the roads and tracks around the site. However, none were seen during the survey. As these species are unmistakable, we have entered them as an incidental record for the site.

Three gecko species (family Gekkonidae) were identified, the most common being the Spiny Tailed Gecko (*Strophurus ciliaris*) with a total of 12 captures. Unusually, these were caught in Funnel Traps and Elliott traps, but were mostly identified during nocturnal searches. All captures were associated with Dogwood trees (*Acacia coriacea*). The Beaked Gecko (*Rhynchoedura ornata*) was not very active during the survey and was only identified on three occasions during nocturnal searches (this species is normally more active but the cold nights would have resulted in reduced activity).

Three species of monitor (i.e. goanna) (family Varanidae) were observed during the Rover 1 survey. The Rusty Desert Monitor (*Varanus eremius*) was fairly active with 3 captures. The Pygmy Mulga Monitor (*Varanus gilleni*) was found sheltering in a small mulga tree crack/hollow within the Mulga groves associated with Site 6. This species is specific to Mulga groves, and we were surprised to identify an individual within such a small grove.

One pygopod (legless lizard), *Delma tincta*, was identified through conversations with onsite employees and photos.

A Mulga Snake (*Pseudechis australis*) and Western Brown Snake (*Pseudonaja nuchalis*) were identified from scale counts on a freshly shed snake skins. Exploration staff mentioned that snakes have reduced activity over the past few months, which may be due to the country drying out after significant rainfall and also the onset of cold winter nights. Black-headed Pythons (*Aspidites melanocephalus*) have also being spotted by exploration staff within the Rover 1 project area.

Table 8: Survey Reptile List

Family	Scientific Name	Common Name	Status	Trapped	Search	Survey Activity
Gekkonidae	<i>Gehyra variegata</i>	Tree Dtella	LC	0	2	Low
Gekkonidae	<i>Rhynchoedura ornata</i>	Beaked Gecko	LC	0	3	Low
Gekkonidae	<i>Strophurus ciliaris</i>	Spiny-tailed Gecko	LC	2	10	High
Pygopodidae	<i>Delma tincta</i>	Black-necked Snake-lizard	LC	0	1	Low
Scincidae	<i>Ctenotus helenae</i>	Helen's Ctenotus	LC	2	0	Low
Scincidae	<i>Ctenotus leonhardii</i>	Leonhardi's Ctenotus	LC	1	0	Low
Scincidae	<i>Ctenotus pantherinus</i>	Leopard Ctenotus	LC	13	0	Mod
Scincidae	<i>Tiliqua multifasciata</i>	Centralian Blue-Tongued Lizard	LC	0	Driller	Low
Agamidae	<i>Ctenophorus isolepis</i>	Military Dragon	LC	3	40	High
Agamidae	<i>Ctenophorus nuchalis</i>	Central Netted Dragon	LC	0	3	Mod
Agamidae	<i>Diporiphora lalliae</i>	Lally's Two-lined Dragon	LC	1	0	Mod
Agamidae	<i>Lophognathus longirostris</i>	Long-nosed Water Dragon	LC	2	2	Mod
Agamidae	<i>Moloch horridus</i>	Thorny Devil	LC	0	Driller	Low
Agamidae	<i>Pogona minor</i>	Dwarf Bearded Dragon	LC	0	2	Low
Varanidae	<i>Varanus eremius</i>	Rusty Desert Monitor	LC	3	0	Mod
Varanidae	<i>Varanus gilleni</i>	Pygmy Mulga Monitor	LC	0	1	Low
Varanidae	<i>Varanus tristis</i>	Black-tailed Monitor	LC	0	1	Low
Pythonidae	<i>Aspidites melanocephalus</i>	Black-headed Python	LC	0	Driller	Low
Elapidae	<i>Pseudechis australis</i>	King Brown Snake	LC	0	1	Low
Elapidae	<i>Pseudonaja nuchalis</i>	Western Brown Snake	LC	0	Driller	Low

4.3.5 Birds

A total of 48 native bird species over 29 families were identified during the survey (Table 9). Birds were most active in the hours of dawn and dusk, and bird count numbers were maximized by varying the sites we visited at these times. Site 4 had the highest bird count with 18 different species and Site 6 recorded 16 different species during the survey. A total of 38 bird species were recorded as incidental records outside of the specific survey sites.

The most active species during the survey were Singing Honeyeaters, Spiny-cheeked Honeyeaters, and Masked Woodswallows.

The Australian Bustard (*Ardeotis australis*) – listed as Vulnerable under the TPWC Act – was the only threatened species identified during the survey. These birds are relatively common in the region.

Table 9: Survey Bird List

Family	Scientific Name	Common Name	Status	Survey Activity
Phasianidae	<i>Coturnix ypsilophora</i>	Brown Quail	LC	Low
Columbidae	<i>Ocyphaps lophotes</i>	Crested Pigeon	LC	Low
Columbidae	<i>Geopelia cuneata</i>	Diamond Dove	LC	Mod
Podargidae	<i>Podargus strigoides</i>	Tawny Frogmouth	LC	Low
Eurostopodidae	<i>Eurostopodus argus</i>	Spotted Nightjar	LC	Mod
Aegothelidae	<i>Aegotheles cristatus</i>	Australian Owlet-nightjar	LC	Low
Ardeidae	<i>Nycticorax caledonicus</i>	Nankeen Night Heron	LC	Low
Accipitridae	<i>Milvus migrans</i>	Black Kite	LC	Low
Falconidae	<i>Falco cenchroides</i>	Nankeen Kestrel	LC	Low
Falconidae	<i>Falco berigora</i>	Brown Falcon	LC	Low
Otididae	<i>Ardeotis australis</i>	Australian Bustard	VU	Low
Turnicidae	<i>Turnix velox</i>	Little Button-quail	LC	Mod
Cacatuidae	<i>Eulophus roseicapilla</i>	Galah	LC	Low
Cacatuidae	<i>Nymphicus hollandicus</i>	Cockatiel	LC	Low
Psittacidae	<i>Melopsittacus undulatus</i>	Budgerigar	LC	Low
Cuculidae	<i>Cacomantis pallidus</i>	Pallid Cuckoo	LC	Low
Strigidae	<i>Ninox novaeseelandiae</i>	Southern Boobook	LC	Mod
Halcyonidae	<i>Todiramphus pyrrhopygius</i>	Red-backed Kingfisher	LC	Low
Maluridae	<i>Malurus leucopterus</i>	White-winged Fairy-wren	LC	Mod
Maluridae	<i>Malurus lamberti</i>	Variiegated Fairy-wren	LC	Low
Acanthizidae	<i>Aphelocephala nigricincta</i>	Banded Whiteface	LC	Low
Meliphagidae	<i>Lichenostomus virescens</i>	Singing Honeyeater	LC	High
Meliphagidae	<i>Lichenostomus keartlandi</i>	Grey-headed Honeyeater	LC	Low
Meliphagidae	<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater	LC	Mod
Meliphagidae	<i>Manorina flavigula</i>	Yellow-throated Miner	LC	Mod
Meliphagidae	<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	LC	High
Meliphagidae	<i>Epthianura tricolor</i>	Crimson Chat	LC	Low
Meliphagidae	<i>Lichmera indistincta</i>	Brown Honeyeater	LC	Low
Meliphagidae	<i>Melithreptus gularis</i>	Black-chinned Honeyeater	LC	Low
Cinclosomatidae	<i>Psophodes occidentalis</i>	Chiming Wedgebill	LC	Mod
Campephagidae	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	LC	Mod
Campephagidae	<i>Lalage sueurii</i>	White-winged Triller	LC	Low
Pachycephalidae	<i>Pachycephala rufiventris</i>	Rufous Whistler	LC	Low
Pachycephalidae	<i>Colluricincla harmonica</i>	Grey Shrike-thrush	LC	Low
Pachycephalidae	<i>Oreica gutturalis</i>	Crested Bellbird	LC	Mod
Artamidae	<i>Artamus personatus</i>	Masked Woodswallow	LC	High
Artamidae	<i>Artamus superciliosus</i>	White-browed Woodswallow	LC	Low
Artamidae	<i>Artamus cinereus</i>	Black-faced Woodswallow	LC	Mod

Family	Scientific Name	Common Name	Status	Survey Activity
Rhipiduridae	<i>Rhipidura leucophrys</i>	Willie Wagtail	LC	High
Corvidae	<i>Corvus bennetti</i>	Little Crow	LC	Mod
Monarchidae	<i>Grallina cyanoleuca</i>	Magpie-lark	LC	Low
Petroicidae	<i>Petroica goodenovii</i>	Red-capped Robin	LC	Low
Petroicidae	<i>Melanodryas cucullata</i>	Hooded Robin	LC	Low
Megaluridae	<i>Cincloramphus mathewsi</i>	Rufous Songlark	LC	Mod
Megaluridae	<i>Cincloramphus cruralis</i>	Brown Songlark	LC	Low
Nectariniidae	<i>Dicaeum hirundinaceum</i>	Mistletoebird	LC	Low
Estrildidae	<i>Taeniopygia guttata</i>	Zebra Finch	LC	Mod
Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian Pipit	LC	Mod

4.3.6 Mammals (excluding bats)

Seven native mammals (excluding microchiropteran bats) were recorded during the survey (Table 10). None being listed as threatened under the *TPWC Act* or *EPBC Act*. Four introduced species were identified, mainly from fresh tracks and/or scats.

Four native mice species (family Muridae) were identified. The most captured species was the Spinifex Hopping Mouse (*Notomys alexis*) with a total of 36 captures and 4 nocturnal sightings. The Desert Mouse (*Pseudomys desertor*) also had a high capture rate with 17 captures. These two species have reacted in response to the existing favourable conditions in central Australia (i.e. several seasons of high rainfall), which has led to a population boom. They are both well documented boom and bust species (Van Dyck and Strahan 2008), which means populations rapidly increase following heavy rain (i.e. providing them with a superabundance of food resource) and then rapidly decline during dry periods. The Sandy Inland Mouse (*Pseudomys hermannsburgensis*) was also fairly common, and seemed to be more active around the exploration camp area (along with the introduced House Mice (*Mus musculus*)). Desert Short-tailed Mouse (*Leggadina forresti*) was caught in the small Mulga Grove, which is a habitat type that is not typical of this species (they generally prefer heavier soil habitats favouring Tussock grasslands, Dyck and Strahan 2008). However, the recent high rainfall in the area may have resulted in some habitats becoming more desirable than normal.

Two dasyurids (carnivorous marsupials) were captured, both *Sminthopsis* species – the Stripe-faced Dunnart (*S. macroura*) and Ooldea Dunnart (*S. ooldea*). All individuals had thick tails indicating good conditions have been experienced over the past year (i.e. thick tails provide them with fat stores that are saved for drought periods).

No macropods were identified during the survey.

Feral animal activity was low with no sightings (only tracks observed), with the exception of the House Mouse which was captured five times using Elliott traps. Other feral species included Cats, Camels, and Cattle.

Table 10: Survey Mammal List

Family	Scientific Name	Common Name	Status	Trapped	Search	Survey Activity
Canidae	<i>Canis lupus</i>	Dingo	LC	0	Tracks	Low
Dasyuridae	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart	LC	4	0	Mod
Dasyuridae	<i>Sminthopsis ooldea</i>	Ooldea Dunnart	LC	4	0	Mod
Muridae	<i>Leggadina forresti</i>	Desert Short-tailed Mouse	LC	1	0	Low
Muridae	<i>Notomys alexis</i>	Spinifex Hopping-mouse	LC	36	4	High
Muridae	<i>Pseudomys desertor</i>	Desert Mouse	LC	17	0	High
Muridae	<i>Pseudomys hermannsburgensis</i>	Sandy Inland Mouse	LC	5	0	Mod
Muridae	<i>Mus musculus</i>	House Mouse	(Int)	5	0	Mod
Felidae	<i>Felis catus</i>	Cat	(Int)	0	Tracks	Low
Camelidae	<i>Camelus dromedarius</i>	Camel	(Int)	0	Tracks	Low
Suidae	<i>Bos taurus</i>	Cattle	(Int)	0	Tracks	Low

4.3.7 Bat Call Analysis

Bat identifications are provided from the Rover project area, near Tennant Creek in the Northern Territory. Two species were identified unambiguously from AnaBat echolocation call recordings – Gould's Wattled Bat (*Chalinolobus gouldii*) and Yellow-bellied Sheath-tailed Bat (*Saccolaimus flaviventris*). Both are native species and common for this region. Details supporting the identifications are provided in a specific Bat ID report in Appendix F.

Yellow-bellied Sheath-tailed Bats are not listed as threatened in the Northern Territory, and are relatively common throughout its range. In the vicinity of Rover 1, this species may roost in Bloodwood tree hollows or possibly in disused mammal burrows. Gould's Wattled Bat is common throughout mainland Australia, however requires tree hollows or buildings for their roosts.

5 Species of Conservation Significance

One species of conservation significance was identified during the survey; four others are likely. All five species are discussed below.

5.1 Australian Bustard (*Ardeotis australis*)

Status: Not Listed – EPBC Act, Vulnerable – TWPC Act

Observed during field surveys: Yes

Species Description:

The Australian Bustard is widespread throughout the Northern Territory and most of Australia but is considered scarce throughout its range. The Bustard prefers open woodland and grasslands but also utilises artificial habitats such as crops and airstrips (Ziembicki 2006). Due to their high level of mobility, these birds are able to cover wide areas. They are regularly observed as lone birds and a big problem is that many areas where Australian Bustards are located are not considered sizable enough to support viable populations (Ziembicki 2006).

It is believed that the Australian Bustard population has historically experienced large fluctuations in numbers. While the population outside of the Northern Territory is still considered significant, a large decline in numbers within the Territory has been observed, particularly in the southern reaches of its range. Due to this, the NT Government has taken a precautionary approach and listed this species as Vulnerable. However, this species status is proposed to be downgraded to Least Concern.

There are a number of theorised threatening processes such as altered habitat, predation, pesticides and grazing that may be influencing this species' viability. Hunting is another major influence as new technology and accessibility to previously remote areas increased the hunting pressures on this species. The larger males may be more susceptible which may have a detrimental impact on the lek breeding system of this species (Ziembicki 2006).

5.2 Emu (*Dromaius novaehollandiae*)

Status: Not Listed – EPBC Act, Vulnerable – TWPC Act

Observed during field surveys: No

Species Description: The Emu is a large flightless bird whose distribution covers extensive parts of mainland Australia. With an ability to be very fast by foot, this species can cover vast tracks of land in the search for food and water if required (Taylor and Woinarski 2006). Emus are omnivorous, feeding on seeds, fruit and insects.

Due to their high mobility and relatively widespread distribution, Emu habitat varies widely. Emu's are found in the Southern temperate regions throughout the arid centre, and all the way to the wet dry tropics of the top end. This species is only restricted in the driest desert regions and numbers are quite low in the Northern populations (Taylor and Woinarski 2006). The Westgold project area is suitable habitat for this species.

The NT Government's listing of this species is a precautionary approach based on an inferred population decline of greater than 30% over the last 10 years or three generations. However, this species status is proposed to be downgraded to Near Threatened. It is speculated that changed landscapes due to altered fire regimes and pastoral activity may be causing the population decline (Taylor and Woinarski 2006).

5.3 Brush-tailed Mulgara (*Dasycercus blythi*)

Status: Vulnerable – EPBC Act, Vulnerable – TWPC Act

Observed during field surveys: No

Species Description: This species is known as *Dasycercus blythi* (Brush-tailed Mulgara) in the NT (formerly grouped with *Dasycercus cristicauda*, the Crest-tailed Mulgara). The Federal Government, however, does not recognise the split between the Brush-tailed and Crest-tailed Mulgara, and therefore this same species is still referred to as *Dasycercus cristicauda* under the EPBC Act. For the sake of this report, the Northern Territory nomenclature will be adopted.

D. blythi inhabits predominately hummock spinifex grassland (Pavey 2006b) and lives in burrows amongst sandy plains (Woolley 2008). The location of Brush-tailed Mulgara colonies may be influenced by the presence of better watered areas such as paleo-drainage systems or drainage lines in sandplain or sand dune habitats (Pavey 2006b). The project area comprises sand plains, but does not lie within a paleo-channel. The closest existing records for *D. blythi* are approximately 60 km from Rover 1 according to Atlas of Living Australia (records from 1982). No Brush-tailed Mulgara were recorded on site despite spotlighting and 450 Elliott trap nights.

The NT Government lists no specific threats to the Brush-tailed Mulgara, but lists altered fire regimes, impacts of grazing, introduced species, environmental degradation and habitat homogenisation as all potentially impacting on this species. The Federal government also has little information on this species but has produced Threat Abatement Plans for both Feral Cats and Feral Rabbits, both of which are considered to have a detrimental impact on *D. blythi*.

5.4 Greater Bilby (*Macrotis lagotis*)

Status: Vulnerable – EPBC Act, Vulnerable – TWPC Act

Observed during field surveys: No

Species Description: The Greater Bilby has distinctive blue-grey fur, long pointed snout and large rabbit like ears. Solely nocturnal, this species exits its burrow well after dark and hunts for food which includes insects, seeds, bulbs, fruit and fungi. Interestingly, soils and sand are regularly consumed by the Bilby along with the targeted prey and may contribute between 20 and 90% of faecal matter (Johnson 2008).

Preferred habitat in the NT includes sandy soils dominated by spinifex hummock grassland, with Acacia and Melaleuca species as the overstorey. Drainage lines, palaeo-channel, and lateritic land systems tend to be better habitat than sandplain and dune systems (Pavey 2006, Woinarski *et al.* 2007). The project area comprises sand plains, but does not lie within a paleo-channel. *M. lagotis* are known to occur in the region with the closest record being 60 km to the north and the majority of records being over 100 km to the north and to the west. No Greater Bilby were recorded on site despite spotlighting and 450 Elliott trap nights. *M. lagotis* are more likely to be encountered on the Rover 1 access road. This is an existing road that has multiple users.

Bilbys are largely restricted to inland arid regions of Australia, a considerable reduction in distribution from their range observed when Europeans first arrived in Australia. According to the Territory Parks and Wildlife Commission, the Bilby is now restricted to less than 20% of its original range in the Northern Territory (Pavey 2006).

There are a number of threatening processes identified by both the Federal and NT Governments and a Recovery Plan has been established and implemented for this species (Pavey 2006). Some of the threatening processes include predation and competition with introduced species, and altered or inappropriate fire regimes.

5.5 Great Desert Skink (*Egernia kintorei*)

Status: Vulnerable – EPBC Act, Vulnerable – TWPC Act

Observed during field surveys: No

Species Description: The Great Desert Skink is a large burrowing lizard that lives in communal burrows greater than 1m deep that may have as many as 10 entrances (Pavey 2006c). Occupancy of *E. kintorei* burrows can be identified if faecal matter is present at the entrance because skink occupants form a shared defecation site (Wilson and Swan 2008). Up to 10 individuals may inhabit any burrow at one time (Pavey 2006c). This species is normally found in sand plains that support hummock grasses, predominately Spinifex and shrubland (Horner 1991).

It is believed that the range of this species has declined over the last century yet there are still scattered populations within inland Australia. It is believed the strongholds for this species include the Tanami Desert, Uluru and sections of the Gibson Desert North of Warburton (McAlpin 2001). The Westgold project area sits within one of these possible strongholds.

A Recovery Plan has been developed for this species (McAlpin 2001). The main cause of decline in numbers of *E. kintorei* is unknown, however a number of threatening process have been identified by the respective governing bodies. An altered fire regime as a result of the cessation of traditional land management techniques is one threat. Very hot, large scale fires are now experienced, reducing the ability of animals such as *E. kintorei* to survive these events (McAlpin 2001). Land homogenisation as a result of reduced traditional land management may also negatively impact such species. Predation by introduced species such as cats and foxes can decrease population numbers, and rabbits may also dig up the burrows resulting in competitive pressures upon *E. kintorei* (Pavey 2006c).

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Appendix A

EPBC Act Search Report

Rover 1 Project

May 2011



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information about the EPBC Act including significance guidelines, forms and application process details can be found at <http://www.environment.gov.au/epbc/assessmentsapprovals/index.html>

Report created: 13/01/12 16:49:04

[Summary](#)

[Details](#)

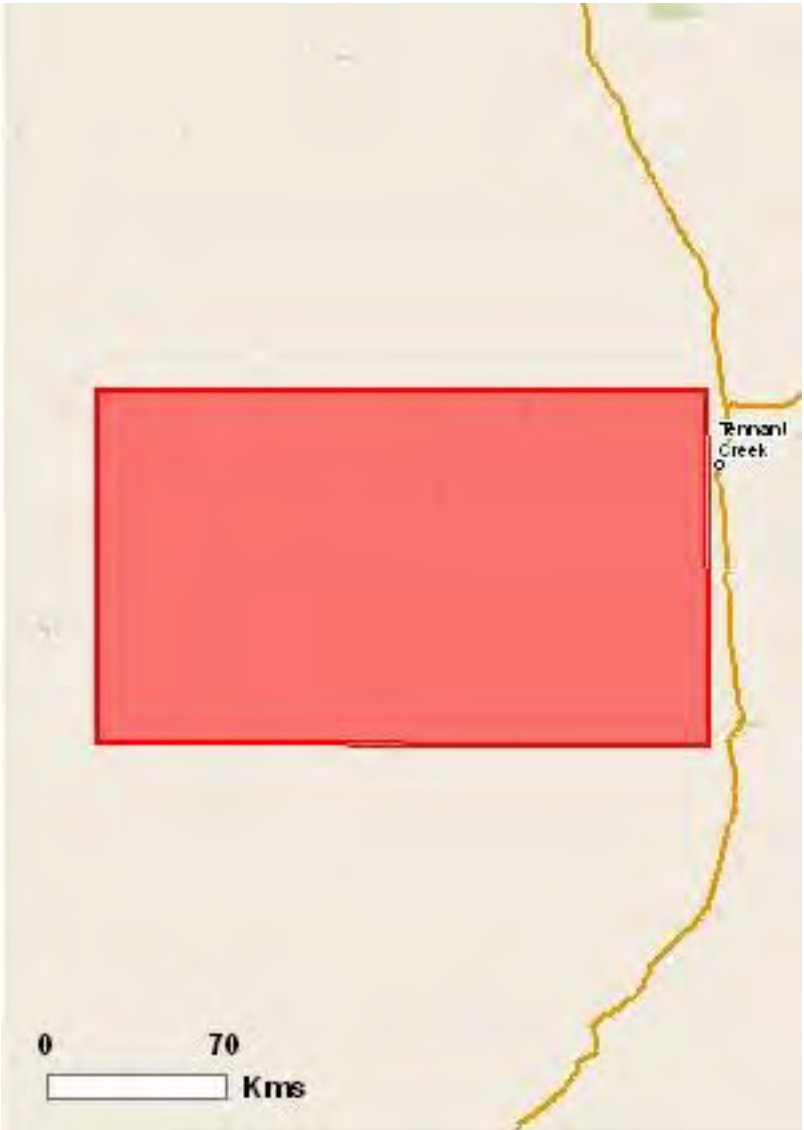
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



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[Buffer: 1.0Km](#)



Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see <http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html>

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	None
Threatened Species:	6
Migratory Species:	9

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage/index.html>

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at <http://www.environment.gov>.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	7
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

Place on the RNE:	3
State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	6
Nationally Important Wetlands:	None

Details

Matters of National Environmental Significance

Threatened Species		[Resource Information]
Name	Status	Type of Presence
BIRDS		
Rostratula australis		
Australian Painted Snipe [77037]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
MAMMALS		
Dasycercus cristicauda Mulgara [328]	Vulnerable	Species or species habitat likely to occur within area
Macrotis lagotis Greater Bilby [282]	Vulnerable	Species or species habitat known to occur within area
Notoryctes typhlops Southern Marsupial Mole, Yitjarritjarri, Itjaritjari [296]	Endangered	Species or species habitat likely to occur within area

PLANTS		
Eleocharis papillosa Dwarf Desert Spike-rush [2519]	Vulnerable	Species or species habitat likely to occur within area
REPTILES		
Liopholis kintorei Great Desert Skink, Tjakura, Warrarna, Mulyamiji [83160]	Vulnerable	Species or species habitat may occur within area

Migratory Species	[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.	

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area

Migratory Terrestrial Species		
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area

Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area
Rostratula benghalensis s. lat. Painted Snipe [889]	Vulnerable*	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Rostratula benghalensis s. lat. Painted Snipe [889]	Vulnerable*	Species or species habitat may occur within area

Extra Information

Places on the RNE		[Resource Information]
Note that not all Indigenous sites may be listed.		
Name	State	Status
Natural		
Tanami Eastern Extension Area	NT	Identified Place
Davenport and Murchison Ranges	NT	Indicative Place
Tanami Desert Wildlife Sanctuary (former)	NT	Registered

State and Territory Reserves		[Resource Information]
Name	State	
Northern Tanami	NT	

Invasive Species		[Resource Information]
Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit,		
Name	Status	Type of Presence
Mammals		
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Plants		
Cenchrus ciliaris		
Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Parkinsonia aculeata		
Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Parthenium hysterophorus		
Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Tamarix aphylla		
Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

Coordinates

-19.38485 131.98785,-19.38247 134.13413,-19.38247 134.13413,-20.63407 134.14364,-20.61979 131.98785,-19.38485 131.98785

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [Department of Environment, Climate Change and Water, New South Wales](#)
- [Department of Sustainability and Environment, Victoria](#)

- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment and Natural Resources, South Australia](#)
- [-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts](#)
- [-Environmental and Resource Management, Queensland](#)
- [-Department of Environment and Conservation, Western Australia](#)
- [-Department of the Environment, Climate Change, Energy and Water](#)
- [-Birds Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-SA Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Atherton and Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [-State Forests of NSW](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

[Please feel free to provide feedback via the Contact Us page.](#)

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Appendix B

Existing Fauna Records

Rover 1 Project

May 2011

Appendix B: All Fauna Records for Rover 1 Project Area (updated May 2011)

Scientific Name	Common Name	Status	Records		
		TPWCA (2007)	NT Fauna Atlas	Ecologia Survey	EcOz Survey
AMPHIBIANS					
<i>Litoria australis</i>	Giant Frog	DD	✓		
<i>Neobatrachus aquilonius</i>	Northern Burrowing Frog	LC	✓		
REPTILES					
<i>Amphibilurous longirostris</i>	Long-snouted Lashtail	LC		✓	✓
<i>Antaresia stimsoni</i>	Stimson's Python	LC	✓		
<i>Aspidites melanocephalus</i>	Black-headed Python	LC			✓
<i>Aspidites ramsayi</i>	Woma Python	NT	✓		
<i>BrachyuropHis roperi</i>	Northern Shovel-nosed Snake	NL	✓		
<i>Carlia tricantha</i>	Three-spined Rainbow Skink	LC		✓	
<i>Ctenophorus isolepis</i>	Military Dragon	LC		✓	✓
<i>Ctenophorus nuchalis</i>	Central Netted Dragon	LC	✓	✓	✓
<i>Ctenotus grandis</i>	Grand Ctenotis	LC		✓	
<i>Ctenotus greeri</i>	Greer's Ctenotis	LC		✓	
<i>Ctenotus helenae</i>	Helen's Ctenotus	LC	✓	✓	✓
<i>Ctenotus leonhardii</i>	Leonhardi's ctenotus	LC			✓
<i>Ctenotus pantherinus</i>	Leopard Ctenotus	LC	✓	✓	✓
<i>Ctenotus robustus</i>	Robust Ctenotus	LC	✓		
<i>Ctenotus saxatilis</i>	Rock Ctenotus	LC	✓		
<i>Cyclodomorphus melanops</i>	Slender Blue-tongued Lizard	LC	✓		
<i>Delma tincta</i>	Excitable Delma	LC		✓	✓
<i>Diplodactylus conspicillatus</i>	Fat-tailed Gecko	LC	✓		
<i>Diporiphora lalliae</i>	Lally's 2-lined Dragon	LC			✓
<i>Eremiascincus fasciolatus</i>	Narrowbanded Sand Swimmer	LC		✓	
<i>Gehyra punctata</i>		NL		✓	
<i>Gehyra variegata</i>	Tree Dtella	LC	✓	✓	✓
<i>Heteronotia binoei</i>	Bynoe's Gecko	LC		✓	
<i>Lialis burtonis</i>	Burton's Legless Lizard	LC	✓		
<i>Liopholis striata</i>	Striated Egernia	LC	✓		
<i>Lucasium stenodactylum</i>	Crowned Gecko	LC	✓		
<i>Moluch horridus</i>	Thorny Devil	LC			✓
<i>Morethia ruficauda</i>	Red-tailed Snake-eyed Skink	LC		✓	
<i>Pagona minor</i>	Dwarf Breaded Dragon	LC			✓
<i>Pseudechis australis</i>	King Brown Snake	LC	✓		✓
<i>Pseudonaja nuchalis</i>	Western Brown Snake	LC	✓		✓
<i>Pygopus nigriceps</i>	Western Hooded Scaly-foot	LC	✓		
<i>Ramphotyphlops diversus</i>	Northern Blind Snake	LC	✓		
<i>Rhynchoedura ornata</i>	Beaked Gecko	LC	✓		✓
<i>Strophurus ciliaris</i>	Spiny-tailed Gecko	LC	✓	✓	✓
<i>Suta punctata</i>	Little Spotted Snake	LC	✓		
<i>Tiliqua multifasciata</i>	Central Blue Tongue Lizard	LC	✓		✓
<i>Varanus acanthurus</i>	Ridge-tailed monitor	LC		✓	

Scientific Name	Common Name	Status	Records		
		TPWCA (2007)	NT Fauna Atlas	Ecologia Survey	EcOz Survey
<i>Varanus brevicauda</i>	Short-tailed Pygmy Monitor	LC	✓		
<i>Varanus eremius</i>	Rusty Desert Monitor	LC	✓	✓	✓
<i>Varanus gilleni</i>	Pygmy Mulga Monitor	LC			✓
<i>Varanus gouldii</i>	Sand Goanna	LC	✓		
<i>Varanus tristis</i>	Black-tailed Monitor	LC		✓	✓
BIRDS					
<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	LC	✓	✓	✓
<i>Acanthiza apicalis</i>	Inland Thornbill	LC		✓	
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	LC	✓		
<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk	LC	✓		
<i>Accipiter fasciatus</i>	Brown Goshawk	LC	✓		
<i>Actitis hypoleucos</i>	Common Sandpiper	LC	✓		
<i>Aegotheles cristatus</i>	Australian Owlet-nightjar	LC		✓	✓
<i>Anas gracilis</i>	Grey Teal	LC	✓		
<i>Anas superciliosa</i>	Pacific Black Duck	LC	✓		
<i>Anhinga novaehollandiae</i>	Australasian Darter	LC	✓		
<i>Anthus novaeseelandiae</i>	Australasian Pipit	LC	✓	✓	✓
<i>Aphelocephala nigricincta</i>	Banded Whiteface	LC			✓
<i>Ardea modesta</i>	Eastern Great Egret	LC	✓		
<i>Ardea pacifica</i>	White-necked Heron	LC	✓		
<i>Ardeotis australis</i>	Australian Bustard	VU	✓	✓	✓
<i>Artamus cinereus</i>	Black-faced Woodswallow	LC	✓	✓	✓
<i>Artamus personatus</i>	Masked Woodswallow	LC			✓
<i>Artamus superciliosus</i>	White-browed Woodswallow	LC			✓
<i>Aythya australis</i>	Hardhead	LC	✓		
<i>Burhinus grallarius</i>	Bush Stone-curlew	NT	✓		
<i>Cacomantis pallidus</i>	Pallid Cuckoo	LC	✓		✓
<i>Chalcites basalis</i>	Horsfield's Bronze-Cuckoo	LC	✓		
<i>Chenonetta jubata</i>	Australian Wood Duck	LC	✓		
<i>Chlidonias hybrida</i>	Whiskered Tern	LC	✓		
<i>Cincloramphus cruralis</i>	Brown Songlark	LC			✓
<i>Cincloramphus mathewsi</i>	Rufous Songlark	LC	✓		✓
<i>Circus approximans</i>	Swamp Harrier	LC	✓		
<i>Colluricincla harmonica</i>	Grey Shrike-thrush	LC			✓
<i>Conopophila rufogularis</i>	Rufous-throated Honeyeater	LC	✓		
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	LC	✓	✓	✓
<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike	LC		✓	
<i>Coturnix ypsilophora</i>	Brown Quail	LC			✓
<i>Corvus bennetti</i>	Little Crow	LC	✓		✓
<i>Corvus orru</i>	Torresian Crow	LC		✓	
<i>Cracticus nigrogularis</i>	Pied Butcherbird	LC	✓		
<i>Cracticus tibicen</i>	Australian Magpie	LC	✓		
<i>Cygnus atratus</i>	Black Swan	LC	✓		

Scientific Name	Common Name	Status	Records		
		TPWCA (2007)	NT Fauna Atlas	Ecologia Survey	EcOz Survey
<i>Dendrocygna eytoni</i>	Plumed Whistling-Duck	LC	✓		
<i>Dicaeum hirundinaceum</i>	Mistletoebird	LC	✓		✓
<i>Dromaius novaehollandiae</i>	Emu	VU		✓	
<i>Egretta novaehollandiae</i>	White-faced Heron	LC	✓		
<i>Elseyornis melanops</i>	Black-fronted Dotterel	LC	✓		
<i>Epthianura tricolor</i>	Crimson Chat	LC			✓
<i>Eremiornis carteri</i>	Spinifexbird	LC	✓		
<i>Erythrogonyx cinctus</i>	Red-kneed Dotterel	LC	✓		
<i>Eulophus roseicapilla</i>	Galah	LC	✓	✓	✓
<i>Eurostopodus argus</i>	Spotted Nightjar	LC	✓		✓
<i>Falco berigora</i>	Brown Falcon	LC	✓	✓	✓
<i>Falco cenchroides</i>	Nankeen Kestrel	LC	✓	✓	✓
<i>Falco subniger</i>	Black Falcon	LC	✓		
<i>Fulica atra</i>	Eurasian Coot	LC	✓		
<i>Geopelia cuneata</i>	Diamond Dove	LC	✓		✓
<i>Gerygone fusca</i>	Western Gerygone	LC		✓	
<i>Glareola maldivarum</i>	Oriental Pratincole	LC	✓		
<i>Grallina cyanoleuca</i>	Magpie-lark	LC	✓		✓
<i>Haliastur sphenurus</i>	Whistling Kite	LC	✓		
<i>Hamirostra melanosternon</i>	Black-breasted Buzzard	LC	✓	✓	
<i>Hieraaetus morphnoides</i>	Little Eagle	LC	✓		
<i>Himantopus himantopus</i>	Black-winged Stilt	LC	✓		
<i>Lalage sueurii</i>	White-winged Triller	LC	✓		✓
<i>Lichenostomus keartlandi</i>	Grey-headed Honeyeater	LC		✓	✓
<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater	LC	✓		✓
<i>Lichenostomus virescens</i>	Singing Honeyeater	LC	✓	✓	✓
<i>Lichmera indistincta</i>	Brown Honeyeater	LC	✓		✓
<i>Lophochroa leadbeateri</i>	Major Mitchell's Cockatoo	LC	✓	✓	
<i>Malacorhynchus membranaceus</i>	Pink-eared Duck	LC	✓		
<i>Malurus lamberti</i>	Variiegated Fairy-wren	LC	✓	✓	✓
<i>Malurus leucopterus</i>	White-winged Fairy-wren	LC	✓	✓	✓
<i>Malurus splendens</i>	Splendid Fairy-wren	LC	✓		
<i>Manorina flavigula</i>	Yellow-throated Miner	LC			✓
<i>Melanodryas c. picata</i>	Hooded Robin (Mainland)	LC	✓	✓	✓
<i>Melithreptus gularis</i>	Black-chinned Honeyeater	LC	✓	✓	✓
<i>Melopsittacus undulatus</i>	Budgerigar	LC	✓	✓	✓
<i>Merops ornatus</i>	Rainbow Bee-eater	LC	✓		
<i>Microcarbo melanoleucos</i>	Little Pied Cormorant	LC	✓		
<i>Milvus migrans</i>	Black Kite	LC	✓		✓
<i>Ninox novaeseelandiae</i>	Southern Boobook	LC		✓	✓
<i>Nycticorax caledonicus</i>	Nankeen Night Heron	LC			✓
<i>Nymphicus hollandicus</i>	Cockatiel	LC	✓		✓
<i>Ocyphaps lophotes</i>	Crested Pigeon	LC	✓	✓	✓

Scientific Name	Common Name	Status	Records		
		TPWCA (2007)	NT Fauna Atlas	Ecologia Survey	EcOz Survey
<i>Oreoica gutturalis</i>	Crested Bellbird	LC		✓	✓
<i>Pachycephala rufiventris</i>	Rufous Whistler	LC	✓	✓	✓
<i>Pardalotus rubricatus</i>	Red-browed Pardalote	LC	✓		
<i>Pelecanus conspicillatus</i>	Australian Pelican	LC	✓		
<i>Petrochelidon ariel</i>	Fairy Martin	LC	✓		
<i>Petrochelidon nigricans</i>	Tree Martin	LC	✓		
<i>Petroica goodenovii</i>	Red-capped Robin	LC		✓	✓
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant	LC	✓		
<i>Platalea flavipes</i>	Yellow-billed Spoonbill	LC	✓		
<i>Platalea regia</i>	Royal Spoonbill	LC	✓		
<i>Plegadis falcinellus</i>	Glossy Ibis	LC	✓		
<i>Podargus strigoides</i>	Tawny Frogmouth	LC			✓
<i>Poliiocephalus poliocephalus</i>	Hoary-headed Grebe	LC	✓		
<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	LC	✓	✓	✓
<i>Psophodes occidentalis</i>	Chiming Wedgebill	LC			
<i>Rhipidura leucophrys</i>	Willie Wagtail	LC	✓	✓	✓
<i>Smicronis brevirostris</i>	Weebill	LC	✓	✓	
<i>Stiltia isabella</i>	Australian Pratincole	LC	✓		
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe	LC	✓		
<i>Taeniopygia guttata</i>	Zebra Finch	LC	✓	✓	✓
<i>Todiramphus pyrrhopygius</i>	Red-backed Kingfisher	LC	✓		✓
<i>Todiramphus sanctus</i>	Sacred Kingfisher	LC	✓		
<i>Tribonyx ventralis</i>	Black-tailed Native-hen	LC	✓		
<i>Turnix velox</i>	Little Button-quail	LC		✓	✓
<i>Vanellus miles</i>	Masked Lapwing	LC	✓		
MAMMALS					
<i>Bos taurus</i>	Cow	(Int)			✓
<i>Camelus dromedarius</i>	Camel	(Int)			✓
<i>Canis lupus</i>	Dingo	LC	✓	✓	✓
<i>Felis catus</i>	Cat	(Int)	✓	✓	✓
<i>Lagorchestes conspicillatus</i>	Spectacled Hare-wallaby	NT	✓	✓	
<i>Macropus rufus</i>	Red Kangaroo	LC	✓	✓	
<i>Mus musculus</i>	House Mouse	(Int)			✓
<i>Notomys alexis</i>	Spinifex Hopping-mouse	LC	✓		✓
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat	LC		✓	
<i>Onychogalea unguifera</i>	Northern Nailtail Wallaby	NT		✓	
<i>Pseudomys desertor</i>	Desert Mouse	LC			✓
<i>Pseudomys hermensbergensis</i>	Sandy Inland Mouse	LC		✓	✓
<i>Pseudomys johnsonii</i>	Centralal Pebble-mound Mouse	NT		✓	
<i>Sminthopsis macroura</i>	Stripe-faced Dunnart	LC	✓		✓
<i>Sminthopsis ooldea</i>	Ooldea Dunnart	LC			✓
<i>Tachyglossus aculeatus</i>	Echidna	LC	✓		
<i>Vulpes vulpes</i>	Fox	(Int)		✓	

Appendix C

Existing Flora Records

Rover 1 Project

May 2011

Appendix C: Existing Flora Records for the Rover 1 Project Area

Existing Flora Records for the Rover 1 Project Area			
Family Name	Scientific Name	Herbarium Record	Flora Atlas Records
ACANTHACEAE	<i>Rostellularia adscendens</i>	✓	
AIZOACEAE	<i>Trianthema pilosa</i>	✓	
AIZOACEAE	<i>Trianthema portulacastrum</i>	✓	
AIZOACEAE	<i>Trianthema triquetra</i>	✓	
AMARANTHACEAE	<i>Achyranthes aspera</i>	✓	
AMARANTHACEAE	<i>Alternanthera angustifolia</i>	✓	
AMARANTHACEAE	<i>Alternanthera nana</i>	✓	
AMARANTHACEAE	<i>Alternanthera nodiflora</i>	✓	
AMARANTHACEAE	<i>Alternanthera pungens</i>	✓	
AMARANTHACEAE	<i>Amaranthus cochleitepalus</i>	✓	
AMARANTHACEAE	<i>Amaranthus viridis</i>	✓	
AMARANTHACEAE	<i>Atriplex vesicaria</i>	✓	
AMARANTHACEAE	<i>Dysphania kalpari</i>	✓	
AMARANTHACEAE	<i>Dysphania rhadinostachya</i>	✓	
AMARANTHACEAE	<i>Gomphrena celosioides</i>	✓	
AMARANTHACEAE	<i>Gomphrena lanata</i>	✓	
AMARANTHACEAE	<i>Maireana villosa</i>	✓	
AMARANTHACEAE	<i>Ptilotus calostachyus</i>	✓	
AMARANTHACEAE	<i>Ptilotus exaltatus</i>	✓	
AMARANTHACEAE	<i>Ptilotus fusiformis</i>	✓	
AMARANTHACEAE	<i>Ptilotus macrocephalus</i>	✓	
AMARANTHACEAE	<i>Ptilotus obovatus</i>	✓	
AMARANTHACEAE	<i>Ptilotus polystachyus</i>	✓	
AMARANTHACEAE	<i>Ptilotus schwartzii</i>	✓	
AMARANTHACEAE	<i>Salsola tragus</i>	✓	
AMARANTHACEAE	<i>Sclerolaena cornishiana</i>	✓	
AMARANTHACEAE	<i>Sclerolaena crenata</i>	✓	✓
AMARANTHACEAE	<i>Sclerolaena minuta</i>	✓	
APOCYNACEAE	<i>Calotropis procera</i>	✓	✓
APOCYNACEAE	<i>Carissa lanceolata</i>	✓	
APOCYNACEAE	<i>Marsdenia australis</i>	✓	
APOCYNACEAE	<i>Rhyncharrhena linearis</i>	✓	
ASTERACEAE	<i>Vittadinia virgata</i>	✓	
ASTERACEAE	<i>Blumea integrifolia</i>	✓	
ASTERACEAE	<i>Blumea saxatilis</i>	✓	
ASTERACEAE	<i>Blumea tenella</i>	✓	
ASTERACEAE	<i>Calotis porphyroglossa</i>	✓	✓

Existing Flora Records for the Rover 1 Project Area

Family Name	Scientific Name	Herbarium Record	Flora Atlas Records
ASTERACEAE	<i>Centipeda minima</i>	✓	
ASTERACEAE	<i>Centipeda nidiformis</i>	✓	
ASTERACEAE	<i>Centipeda racemosa</i>	✓	✓
ASTERACEAE	<i>Coleocoma centaurea</i>	✓	✓
ASTERACEAE	<i>Conyza bonariensis</i>	✓	
ASTERACEAE	<i>Glossocardia bidens</i>	✓	
ASTERACEAE	<i>Lactuca serriola</i>	✓	
ASTERACEAE	<i>Myriocephalus rudallii</i>	✓	
ASTERACEAE	<i>Pluchea dunlopil</i>	✓	✓
ASTERACEAE	<i>Pluchea ferdinandi-muelleri</i>	✓	
ASTERACEAE	<i>Pterocaulon serrulatum</i>	✓	
ASTERACEAE	<i>Pterocaulon sphacelatum</i>	✓	
ASTERACEAE	<i>Sonchus oleraceus</i>	✓	
ASTERACEAE	<i>Streptoglossa macrocephala</i>	✓	
ASTERACEAE	<i>Taraxacum officinale</i>	✓	
ASTERACEAE	<i>Tridax procumbens</i>	✓	
BORAGINACEAE	<i>Coldenia procumbens</i>	✓	
BORAGINACEAE	<i>Ehretia saligna</i>	✓	
BORAGINACEAE	<i>Heliotropium epacrideum</i>	✓	
BORAGINACEAE	<i>Heliotropium haesum</i>	✓	
BORAGINACEAE	<i>Heliotropium leptaleum</i>	✓	
BORAGINACEAE	<i>Heliotropium ovalifolium</i>	✓	✓
BORAGINACEAE	<i>Heliotropium skeleton</i>	✓	
BORAGINACEAE	<i>Heliotropium sphaericum</i>	✓	
BORAGINACEAE	<i>Trichodesma zeylanicum</i>	✓	
CAMPANULACEAE	<i>Isotoma luticola</i>	✓	
CAPPARACEAE	<i>Capparis lasiantha</i>	✓	
CAPPARACEAE	<i>Capparis umbonata</i>	✓	
CARYOPHYLLACEAE	<i>Polycarpaea breviflora</i>	✓	
CARYOPHYLLACEAE	<i>Polycarpaea spirostylis</i>	✓	
CELASTRACEAE	<i>Macgregoria racemigera</i>	✓	✓
CELASTRACEAE	<i>Stackhousia clementii</i>	✓	✓
CELASTRACEAE	<i>Stackhousia intermedia</i>	✓	✓
CLEOMACEAE	<i>Cleome viscosa</i>	✓	
COMMELINACEAE	<i>Murdannia graminea</i>	✓	
CONVOLVULACEAE	<i>Bonamia alatisemina</i>	✓	
CONVOLVULACEAE	<i>Bonamia media</i>	✓	
CONVOLVULACEAE	<i>Bonamia pannosa</i>	✓	
CONVOLVULACEAE	<i>Evolvulus alsinoides</i>	✓	
CONVOLVULACEAE	<i>Ipomoea costata</i>	✓	
CONVOLVULACEAE	<i>Ipomoea muelleri</i>	✓	

Existing Flora Records for the Rover 1 Project Area			
Family Name	Scientific Name	Herbarium Record	Flora Atlas Records
CUCURBITACEAE	<i>Austrobryonia centralis</i>	✓	
CUCURBITACEAE	<i>Citrullus colocynthis</i>	✓	
CUCURBITACEAE	<i>Citrullus lanatus</i>	✓	✓
CUCURBITACEAE	<i>Cucumis maderaspatanus</i>	✓	
CYPERACEAE	<i>Bulbostylis barbata</i>	✓	
CYPERACEAE	<i>Cyperus blakeanus</i>	✓	
CYPERACEAE	<i>Cyperus concinnus</i>	✓	
CYPERACEAE	<i>Cyperus conicus</i>	✓	
CYPERACEAE	<i>Cyperus dactyloides</i>	✓	
CYPERACEAE	<i>Cyperus involucratus</i>	✓	
CYPERACEAE	<i>Cyperus squarrosus</i>	✓	✓
CYPERACEAE	<i>Fimbristylis aestivalis</i>	✓	
CYPERACEAE	<i>Fimbristylis ammobia</i>	✓	
CYPERACEAE	<i>Fimbristylis caespitosa</i>	✓	
CYPERACEAE	<i>Fimbristylis dichotoma</i>	✓	
CYPERACEAE	<i>Fimbristylis eremophila</i>	✓	
CYPERACEAE	<i>Fimbristylis simulans</i>	✓	
CYPERACEAE	<i>Lipocarpa microcephala</i>	✓	
DROSERACEAE	<i>Drosera indica</i>	✓	
ELATINACEAE	<i>Bergia henshallii</i>	✓	
ELATINACEAE	<i>Bergia occultipetala</i>	✓	✓
ELATINACEAE	<i>Bergia pedicellaris</i>	✓	
ELATINACEAE	<i>Bergia perennis</i>	✓	
ELATINACEAE	<i>Bergia perennis</i> subsp. <i>obtusifolia</i>		✓
EUPHORBIACEAE	<i>Euphorbia australis</i>	✓	
EUPHORBIACEAE	<i>Euphorbia biconvexa</i>	✓	
EUPHORBIACEAE	<i>Euphorbia boophthona</i>	✓	
EUPHORBIACEAE	<i>Euphorbia hirta</i>	✓	
EUPHORBIACEAE	<i>Euphorbia hyssopifolia</i>	✓	
EUPHORBIACEAE	<i>Euphorbia prostrata</i>	✓	
EUPHORBIACEAE	<i>Microstachys chamaelea</i>	✓	
FABACEAE	<i>Acacia acradenia</i>	✓	
FABACEAE	<i>Acacia adsurgens</i>	✓	
FABACEAE	<i>Acacia ancistrocarpa</i>	✓	
FABACEAE	<i>Acacia aneura</i>	✓	
FABACEAE	<i>Acacia bivenosa</i>	✓	
FABACEAE	<i>Acacia chippendalei</i>	✓	
FABACEAE	<i>Acacia colei</i>	✓	
FABACEAE	<i>Acacia cowleana</i>	✓	
FABACEAE	<i>Acacia cuthbertsonii</i>	✓	
FABACEAE	<i>Acacia elachantha</i>	✓	

Existing Flora Records for the Rover 1 Project Area			
Family Name	Scientific Name	Herbarium Record	Flora Atlas Records
FABACEAE	<i>Acacia gonoclada</i>	✓	
FABACEAE	<i>Acacia hemignosta</i>	✓	
FABACEAE	<i>Acacia hilliania</i>	✓	
FABACEAE	<i>Acacia lysiphloia</i>	✓	
FABACEAE	<i>Acacia melleodora</i>	✓	
FABACEAE	<i>Acacia monticola</i>	✓	
FABACEAE	<i>Acacia neurocarpa</i>	✓	✓
FABACEAE	<i>Acacia perryi</i>	✓	
FABACEAE	<i>Acacia sericophylla</i>	✓	
FABACEAE	<i>Acacia spondylophylla</i>	✓	
FABACEAE	<i>Acacia stipuligera</i>	✓	
FABACEAE	<i>Acacia tenuissima</i>	✓	
FABACEAE	<i>Aenictophyton reconditum</i>	✓	
FABACEAE	<i>Aeschynomene indica</i>	✓	
FABACEAE	<i>Albizia lebbeck</i>	✓	
FABACEAE	<i>Alysicarpus ovalifolius</i>	✓	
FABACEAE	<i>Cajanus marmoratus</i>	✓	
FABACEAE	<i>Chamaecrista symonii</i>	✓	
FABACEAE	<i>Crotalaria medicaginea</i>	✓	
FABACEAE	<i>Crotalaria novae-hollandiae</i>	✓	
FABACEAE	<i>Cullen balsamicum</i>	✓	
FABACEAE	<i>Cullen cinereum</i>	✓	✓
FABACEAE	<i>Cullen martinii</i>	✓	
FABACEAE	<i>Cullen pustulatum</i>	✓	
FABACEAE	<i>Dichrostachys spicata</i>	✓	
FABACEAE	<i>Erythrina vespertilio</i>	✓	
FABACEAE	<i>Galactia tenuiflora</i>	✓	
FABACEAE	<i>Gastrolobium grandiflorum</i>	✓	
FABACEAE	<i>Indigofera colutea</i>	✓	
FABACEAE	<i>Indigofera georgei</i>	✓	
FABACEAE	<i>Indigofera linifolia</i>	✓	
FABACEAE	<i>Indigofera linnaei</i>	✓	
FABACEAE	<i>Isotropis atropurpurea</i>	✓	
FABACEAE	<i>Isotropis winneckeii</i>	✓	
FABACEAE	<i>Leptosema anomalum</i>	✓	
FABACEAE	<i>Leptosema chambersii</i>	✓	
FABACEAE	<i>Macroptilium atropurpureum</i>	✓	
FABACEAE	<i>Mirbelia viminalis</i>	✓	
FABACEAE	<i>Neptunia dimorphantha</i>	✓	
FABACEAE	<i>Petalostylis cassioides</i>	✓	
FABACEAE	<i>Rhynchosia minima</i>	✓	

Existing Flora Records for the Rover 1 Project Area			
Family Name	Scientific Name	Herbarium Record	Flora Atlas Records
FABACEAE	<i>Senna artemisioides</i>	✓	
FABACEAE	<i>Senna costata</i>	✓	
FABACEAE	<i>Senna glutinosa</i>	✓	
FABACEAE	<i>Senna notabilis</i>	✓	
FABACEAE	<i>Senna occidentalis</i>	✓	
FABACEAE	<i>Senna oligoclada</i>	✓	
FABACEAE	<i>Senna pleurocarpa</i>	✓	
FABACEAE	<i>Stylosanthes hamata</i>	✓	
FABACEAE	<i>Swainsona burkei</i>	✓	
FABACEAE	<i>Tephrosia brachyodon</i>	✓	
FABACEAE	<i>Tephrosia lasiochlaena</i>	✓	
FABACEAE	<i>Tephrosia simplicifolia</i>	✓	
FABACEAE	<i>Tephrosia sp.</i>	✓	
FABACEAE	<i>Vigna lanceolata</i>	✓	
FABACEAE	<i>Zornia albiflora</i>	✓	
GOODENIACEAE	<i>Goodenia armitiana</i>	✓	
GOODENIACEAE	<i>Goodenia goodeniacea</i>	✓	
GOODENIACEAE	<i>Goodenia heterochila</i>	✓	
GOODENIACEAE	<i>Goodenia lamprosperma</i>	✓	
GOODENIACEAE	<i>Goodenia lunata</i>	✓	
GOODENIACEAE	<i>Goodenia ramelii</i>	✓	
GOODENIACEAE	<i>Goodenia triodiophila</i>	✓	
GOODENIACEAE	<i>Goodenia vilmoriniae</i>	✓	
GOODENIACEAE	<i>Scaevola ovalifolia</i>	✓	✓
GOODENIACEAE	<i>Scaevola parvifolia</i>	✓	
GOODENIACEAE	<i>Velleia connata</i>	✓	
GYROSTEMONACEAE	<i>Gyrostemon tepperi</i>	✓	
LAMIACEAE	<i>Clerodendrum floribundum</i>	✓	
LAMIACEAE	<i>Dicrastylis costelloi</i>	✓	✓
LAMIACEAE	<i>Dicrastylis exsuccosa</i>	✓	
LAMIACEAE	<i>Newcastelia spodioptricha</i>	✓	
LAURACEAE	<i>Cassytha capillaris</i>	✓	
LORANTHACEAE	<i>Amyema maidenii</i>	✓	
LORANTHACEAE	<i>Dendrophthoe odontocalyx</i>	✓	
LORANTHACEAE	<i>Diplatia grandibractea</i>	✓	
LORANTHACEAE	<i>Lysiana spathulata</i>	✓	
LYTHRACEAE	<i>Ammannia multiflora</i>	✓	
LYTHRACEAE	<i>Lythrum wilsonii</i>	✓	✓
LYTHRACEAE	<i>Rotala occultiflora</i>	✓	
MALVACEAE	<i>Abutilon fraseri</i>	✓	
MALVACEAE	<i>Abutilon otocarpum</i>	✓	

Existing Flora Records for the Rover 1 Project Area			
Family Name	Scientific Name	Herbarium Record	Flora Atlas Records
MALVACEAE	<i>Corchorus sericeus</i>	✓	
MALVACEAE	<i>Corchorus sidoides</i>	✓	
MALVACEAE	<i>Gossypium australe</i>	✓	
MALVACEAE	<i>Gossypium bickii</i>	✓	
MALVACEAE	<i>Gossypium sturtianum</i>	✓	
MALVACEAE	<i>Hibiscus burtonii</i>	✓	
MALVACEAE	<i>Hibiscus meraukensis</i>	✓	
MALVACEAE	<i>Hibiscus sturtii</i>	✓	
MALVACEAE	<i>Keraudrenia nephrosperma</i>	✓	
MALVACEAE	<i>Malvastrum coromandelianum</i>	✓	
MALVACEAE	<i>Melhania oblongifolia</i>	✓	
MALVACEAE	<i>Sida arenicola</i>	✓	
MALVACEAE	<i>Sida cleisocalyx</i>	✓	
MALVACEAE	<i>Sida cunninghamii</i>	✓	
MALVACEAE	<i>Sida filiformis</i>	✓	
MALVACEAE	<i>Sida platycalyx</i>	✓	
MALVACEAE	<i>Sida sp.</i>	✓	
MALVACEAE	<i>Sida spinosa</i>	✓	
MALVACEAE	<i>Waltheria indica</i>	✓	
MENISPERMACEAE	<i>Tinospora smilacina</i>	✓	
MOLLUGINACEAE	<i>Mollugo molluginis</i>	✓	
MYRTACEAE	<i>Calytrix carinata</i>	✓	
MYRTACEAE	<i>Corymbia aspera</i>	✓	
MYRTACEAE	<i>Corymbia deserticola</i>	✓	
MYRTACEAE	<i>Corymbia drysdalensis</i>	✓	
MYRTACEAE	<i>Corymbia flavescens</i>	✓	
MYRTACEAE	<i>Corymbia setosa</i>	✓	
MYRTACEAE	<i>Corymbia sphaerica</i>	✓	✓
MYRTACEAE	<i>Corymbia terminalis</i>	✓	
MYRTACEAE	<i>Eucalyptus camaldulensis</i>	✓	
MYRTACEAE	<i>Eucalyptus chlorophylla</i>	✓	
MYRTACEAE	<i>Eucalyptus coolabah</i>	✓	
MYRTACEAE	<i>Eucalyptus leucophloia</i>	✓	
MYRTACEAE	<i>Eucalyptus normantonensis</i>	✓	
MYRTACEAE	<i>Eucalyptus odontocarpa</i>	✓	
MYRTACEAE	<i>Eucalyptus pachyphylla</i>	✓	
MYRTACEAE	<i>Eucalyptus pruinosa</i>	✓	
MYRTACEAE	<i>Eucalyptus victrix</i>	✓	✓
MYRTACEAE	<i>Melaleuca glomerata</i>	✓	✓
MYRTACEAE	<i>Melaleuca lasiandra</i>	✓	
MYRTACEAE	<i>Melaleuca nervosa</i>	✓	

Existing Flora Records for the Rover 1 Project Area			
Family Name	Scientific Name	Herbarium Record	Flora Atlas Records
MYRTACEAE	<i>Melaleuca viridiflora</i>	✓	
NYCTAGINACEAE	<i>Boerhavia repleta</i>	✓	✓
OLEACEAE	<i>Jasminum calcareum</i>	✓	
OXALIDACEAE	<i>Oxalis corniculata</i>	✓	
PHYLLANTHACEAE	<i>Phyllanthus sp.</i>	✓	
PICRODENDRACEAE	<i>Petalostigma nummularium</i>	✓	
POACEAE	<i>Aristida inaequiglumis</i>	✓	
POACEAE	<i>Aristida jerichoensis</i>	✓	
POACEAE	<i>Bothriochloa bladhii</i>	✓	
POACEAE	<i>Bothriochloa pertusa</i>	✓	
POACEAE	<i>Brachyachne convergens</i>	✓	
POACEAE	<i>Cenchrus ciliaris</i>	✓	
POACEAE	<i>Cenchrus clandestinus</i>	✓	
POACEAE	<i>Cenchrus echinatus</i>	✓	
POACEAE	<i>Cenchrus pedicellatus</i>	✓	
POACEAE	<i>Cenchrus pennisetiformis</i>	✓	
POACEAE	<i>Chloris barbata</i>	✓	
POACEAE	<i>Chloris pectinata</i>	✓	
POACEAE	<i>Chloris virgata</i>	✓	
POACEAE	<i>Chrysopogon fallax</i>	✓	✓
POACEAE	<i>Cymbopogon ambiguus</i>	✓	
POACEAE	<i>Cymbopogon bombycinus</i>	✓	
POACEAE	<i>Cynodon dactylon</i>	✓	
POACEAE	<i>Dactyloctenium radulans</i>	✓	
POACEAE	<i>Dichanthium fecundum</i>	✓	
POACEAE	<i>Digitaria bicornis</i>	✓	
POACEAE	<i>Digitaria brownii</i>	✓	
POACEAE	<i>Digitaria ciliaris</i>	✓	
POACEAE	<i>Eleusine indica</i>	✓	
POACEAE	<i>Enneapogon polyphyllus</i>	✓	
POACEAE	<i>Eragrostis elongata</i>	✓	
POACEAE	<i>Eragrostis eriopoda</i>	✓	
POACEAE	<i>Eragrostis fallax</i>	✓	
POACEAE	<i>Eragrostis leptocarpa</i>	✓	
POACEAE	<i>Eragrostis mexicana</i>	✓	
POACEAE	<i>Eragrostis setifolia</i>	✓	
POACEAE	<i>Eragrostis tenellula</i>	✓	
POACEAE	<i>Eragrostis tenuifolia</i>	✓	
POACEAE	<i>Eriachne aristidea</i>	✓	
POACEAE	<i>Eriachne armitii</i>	✓	
POACEAE	<i>Eriachne ciliata</i>	✓	

Existing Flora Records for the Rover 1 Project Area			
Family Name	Scientific Name	Herbarium Record	Flora Atlas Records
POACEAE	<i>Eriachne helmsii</i>	✓	
POACEAE	<i>Eriachne mucronata</i>	✓	
POACEAE	<i>Eriachne obtusa</i>	✓	
POACEAE	<i>Eriachne pulchella</i>	✓	
POACEAE	<i>Eulalia aurea</i>	✓	
POACEAE	<i>Iseilema membranaceum</i>	✓	
POACEAE	<i>Melinis repens</i>	✓	
POACEAE	<i>Panicum decompositum</i>	✓	
POACEAE	<i>Panicum effusum</i>	✓	
POACEAE	<i>Panicum mindanaense</i>	✓	
POACEAE	<i>Paraneurachne muelleri</i>	✓	
POACEAE	<i>Paspalidium rarum</i>	✓	
POACEAE	<i>Paspalum scrobiculatum</i>	✓	
POACEAE	<i>Perotis rara</i>	✓	
POACEAE	<i>Polypogon viridis</i>	✓	
POACEAE	<i>Pseudoraphis spinescens</i>	✓	
POACEAE	<i>Setaria surgens</i>	✓	
POACEAE	<i>Sporobolus australasicus</i>	✓	
POACEAE	<i>Sporobolus coromandelianus</i>	✓	
POACEAE	<i>Themeda triandra</i>	✓	
POACEAE	<i>Triodia bitextura</i>	✓	
POACEAE	<i>Triodia pungens</i>	✓	
POACEAE	<i>Triodia schinzii</i>	✓	
POACEAE	<i>Triodia spicata</i>	✓	✓
POACEAE	<i>Urochloa gilesii</i>	✓	
POACEAE	<i>Urochloa mosambicensis</i>	✓	
POACEAE	<i>Urochloa piligera</i>	✓	
POACEAE	<i>Urochloa praetervisa</i>	✓	
POACEAE	<i>Whiteochloa cymbiformis</i>	✓	
POACEAE	<i>Yakirra australiensis</i>	✓	
POLYGALACEAE	<i>Polygala sp.</i>	✓	
PORTULACACEAE	<i>Calandrinia ptychosperma</i>	✓	
PORTULACACEAE	<i>Calandrinia stagnensis</i>	✓	
PORTULACACEAE	<i>Portulaca filifolia</i>	✓	
PORTULACACEAE	<i>Portulaca oleracea</i>	✓	
PROTEACEAE	<i>Grevillea refracta</i>	✓	
PROTEACEAE	<i>Grevillea wickhamii</i>	✓	
PROTEACEAE	<i>Hakea arborescens</i>	✓	
PROTEACEAE	<i>Hakea chordophylla</i>	✓	
PROTEACEAE	<i>Hakea macrocarpa</i>	✓	
RUBIACEAE	<i>Dentella asperata</i>	✓	

Existing Flora Records for the Rover 1 Project Area			
Family Name	Scientific Name	Herbarium Record	Flora Atlas Records
RUBIACEAE	<i>Oldenlandia corymbosa</i>	✓	
RUBIACEAE	<i>Psydrax ammophila</i>	✓	
RUBIACEAE	<i>Spermacoce hillii</i>	✓	
RUBIACEAE	<i>Synaptantha tillaeacea</i>	✓	
RUBIACEAE	<i>Synaptantha tillaeacea</i> var. <i>tillaeacea</i>		✓
RUBIACEAE	<i>Synaptantha tillaeacea</i> var. Western Tanami (D.E.Albrecht 7852)		✓
SAPINDACEAE	<i>Dodonaea coriacea</i>	✓	
SAPINDACEAE	<i>Dodonaea lanceolata</i>	✓	
SCROPHULARIACEAE	<i>Eremophila gilesii</i>	✓	
SCROPHULARIACEAE	<i>Eremophila latrobei</i>	✓	
SCROPHULARIACEAE	<i>Eremophila longifolia</i>	✓	
SCROPHULARIACEAE	<i>Eremophila macdonnellii</i>	✓	
SCROPHULARIACEAE	<i>Eremophila obovata</i>	✓	
SOLANACEAE	<i>Solanum centrale</i>	✓	
SOLANACEAE	<i>Solanum chippendalei</i>	✓	
SOLANACEAE	<i>Solanum cleistogamum</i>	✓	✓
SOLANACEAE	<i>Solanum ferocissimum</i>	✓	
SOLANACEAE	<i>Solanum quadriloculatum</i>	✓	✓
SOLANACEAE	<i>Solanum succosum</i>	✓	
STYLIDIACEAE	<i>Stylidium desertorum</i>	✓	
SURIANACEAE	<i>Stylobasium spathulatum</i>	✓	
VIOLACEAE	<i>Hybanthus aurantiacus</i>	✓	
ZYGOPHYLLACEAE	<i>Tribulus terrestris</i>	✓	

Appendix D

Flora Survey Records (EcOz)

Rover 1 Project

May 2011

Appendix D: Flora Survey Records, Rover 1 May 2011 (collected by EcOz)

Family Name	Scientific Name	Site						Incidental
		1	2	3	4	5	6	
AMARANTHACEAE	<i>Ptilotus calostachyus</i>				X	X		X
AMARANTHACEAE	<i>Ptilotus sessilifolius</i>					X		X
ASTERACEAE	<i>Pterocaulon serrulatum</i>							X
ASTERACEAE	<i>Pterocaulon sphacelatum</i>						X	X
CAESALPINACEAE	<i>Petalostylis cassioides</i>							X
CHENOPODIACEAE	<i>Salsola tragus</i>							X
CUCURBITACEAE	<i>Cucumis maderaspatanus</i>				X		X	X
CYPERACEAE	<i>Bulbostylis barbata</i>						X	X
EUPHORBIACEAE	<i>Euphorbia tannensis</i>							X
ELATINACEAE	<i>Bergia henshallii</i>							X
FABACEAE	<i>Acacia adsurgens</i>	X			X			X
FABACEAE	<i>Acacia ancistrocarpa</i>	X		X	X	X		X
FABACEAE	<i>Acacia aneura</i>						X	X
FABACEAE	<i>Acacia colei</i>							X
FABACEAE	<i>Acacia coriacea</i>	X	X	X	X	X		X
FABACEAE	<i>Acacia lysiphloia</i>	X	X	X	X	X	X	X
FABACEAE	<i>Indigofera georgei</i>	X		X		X		X
FABACEAE	<i>Indigofera linifolia</i>		X	X	X	X	X	X
FABACEAE	<i>Senna artemisioides oligophylla</i>	X	X	X	X	X	X	X
FABACEAE	<i>Senna artemisioides helmsii</i>	X				X	X	X
FABACEAE	<i>Senna notabilis</i>					X	X	X
GOODENIACEAE	<i>Goodenia armitiana</i>		X			X		X
GOODENIACEAE	<i>Scaevola ovalifolia</i>	X	X		X		X	X
GOODENIACEAE	<i>Scaevola parvifolia</i>	X	X	X	X			X
GYROSTEMONACEAE	<i>Codonocarpus cotinifolius</i>							X
LAMIACEAE	<i>Dicrastylis exsuccosa</i>				X			X
LORANTHACEAE	<i>Lysiana exocarpi</i>	X						X

Family Name	Scientific Name	Site						Incidental
		1	2	3	4	5	6	
MALVACEAE	<i>Abutilon otocarpum</i>							X
MALVACEAE	<i>Corchorus sidoides</i>	X	X	X	X			X
MALVACEAE	<i>Gossypium australe</i>	X	X	X	X	X	X	X
MALVACEAE	<i>Keraudrenia nephrosperma</i>				X			X
MALVACEAE	<i>Malvastrum americanum</i>						X	X
MALVACEAE	<i>Sida fibulifera</i>						X	X
MENISPERMACEAE	<i>Tinospora smilacina</i>							X
MYRTACEAE	<i>Calytrix aparrerinja</i>			X				X
MYRTACEAE	<i>Corymbia opaca</i>	X	X	X	X			X
MYRTACEAE	<i>Melaleuca lasiandra</i>			X	X	X	X	X
NYCTAGINACEAE	<i>Boerhavia coccinea</i>						X	X
POACEAE	<i>Aristida contorta</i>					X	X	X
POACEAE	<i>Aristida holothera</i>		X	X	X	X	X	X
POACEAE	<i>Aristida inaequiglumis</i>	X	X	X				X
POACEAE	<i>Aristida latifolia</i>		X			X		X
POACEAE	<i>Enneapogon polyphyllus</i>	X						X
POACEAE	<i>Eragrostis eriopoda</i>		X	X	X	X	X	X
POACEAE	<i>Eulalia aurea</i>						X	X
POACEAE	<i>Iseilema vaginiflorum</i>	X	X	X	X		X	X
POACEAE	<i>Paraneurachne muelleri</i>	X	X				X	X
POACEAE	<i>Triodia pungens</i>	X	X	X	X	X	X	X
POACEAE	<i>Triodia schinzii</i>		X			X		X
PROTEACEAE	<i>Hakea macrocarpa</i>	X						X
SCROPHULARIACEAE	<i>Eremophila latrobei</i>	X		X		X	X	X
SCROPHULARIACEAE	<i>Eremophila longifolia</i>				X		X	X
SOLANACEAE	<i>Solanum</i> sp.		X			X		X
VIOLACEAE	<i>Hybanthus aurantiacus</i>							X
TOTAL SPECIES COUNT		20	19	18	21	21	24	54

Appendix E

Fauna Survey Records (EcOz)

Rover 1 Project

May 2011

Family	Scientific Name	Common Name	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6A	Site 6B	Inc	Total
Eurostopdidae	<i>Eurostopodus argus</i>	Spotted Nightjar			1					1	2
Aegothelidae	<i>Aegotheles cristatus</i>	Australian Owlet-nightjar							1	1	2
Ardeidae	<i>Nycticorax caledonicus</i>	Nankeen Night Heron								1	1
Accipitridae	<i>Milvus migrans</i>	Black Kite								1	1
Falconidae	<i>Falco cenchroides</i>	Nankeen Kestrel								1	1
Falconidae	<i>Falco berigora</i>	Brown Falcon			1					1	2
Otididae	<i>Ardeotis australis</i>	Australian Bustard			1						1
Turnicidae	<i>Turnix velox</i>	Little Button-quail			1					1	2
Cacatuidae	<i>Eulophus roseicapilla</i>	Galah				1				1	2
Cacatuidae	<i>Nymphicus hollandicus</i>	Cockatiel								1	1
Psittacidae	<i>Melopsittacus undulatus</i>	Budgerigar			1					1	2
Cuculidae	<i>Cacomantis pallidus</i>	Pallid Cuckoo								1	1
Strigidae	<i>Ninox novaeseelandiae</i>	Southern Boobook				1				1	2
Halcyonidae	<i>Todiramphus pyrrhopygius</i>	Red-backed Kingfisher								1	1
Maluridae	<i>Malurus leucopterus</i>	White-winged Fairy-wren								1	1
Maluridae	<i>Malurus lamberti</i>	Variegated Fairy-wren					1	1	1	1	4
Acanthizidae	<i>Aphelocephala nigricincta</i>	Banded Whiteface								1	1
Meliphagidae	<i>Lichenostomus virescens</i>	Singing Honeyeater			1	1	1	1	1	1	6
Meliphagidae	<i>Lichenostomus keartlandi</i>	Grey-headed Honeyeater				1	1	1	1		4
Meliphagidae	<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater				1				1	2
Meliphagidae	<i>Manorina flavigula</i>	Yellow-throated Miner				1				1	2
Meliphagidae	<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater			1	1	1	1	1	1	6
Meliphagidae	<i>Epthianura tricolor</i>	Crimson Chat	1							1	2
Meliphagidae	<i>Lichmera indistincta</i>	Brown Honeyeater							1	1	2
Meliphagidae	<i>Melithreptus gularis</i>	Black-chinned Honeyeater	1								1
Cinclosomatidae	<i>Psophodes occidentalis</i>	Chiming Wedgebill		1		1	1	1		1	5
Campephagidae	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike				1			1	1	3
Campephagidae	<i>Lalage sueurii</i>	White-winged Triller							1		1
Pachycephalidae	<i>Pachycephala rufiventris</i>	Rufous Whistler	1							1	2
Pachycephalidae	<i>Colluricincla harmonica</i>	Grey Shrike-thrush							1	1	2
Pachycephalidae	<i>Oreoica gutturalis</i>	Crested Bellbird			1	1	1	1	1		5

Family	Scientific Name	Common Name	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6A	Site 6B	Inc	Total
Artamidae	<i>Artamus personatus</i>	Masked Woodswallow	1	1	1	1	1	1	1	1	8
Artamidae	<i>Artamus superciliosus</i>	White-browed Woodswallow				1					1
Artamidae	<i>Artamus cinereus</i>	Black-faced Woodswallow	1	1	1	1	1	1	1	1	8
Rhipiduridae	<i>Rhipidura leucophrys</i>	Willie Wagtail	1			1	1	1		1	5
Corvidae	<i>Corvus bennetti</i>	Little Crow			1		1	1		1	4
Monarchidae	<i>Grallina cyanoleuca</i>	Magpie-lark								1	1
Petroicidae	<i>Petroica goodenovii</i>	Red-capped Robin								1	1
Petroicidae	<i>Melanodryas cucullata</i>	Hooded Robin	1						1		2
Megaluridae	<i>Cincloramphus mathewsi</i>	Rufous Songlark				1					1
Megaluridae	<i>Cincloramphus cruralis</i>	Brown Songlark				1					1
Nectariniidae	<i>Dicaeum hirundinaceum</i>	Mistletoebird							1		1
Estrildidae	<i>Taeniopygia guttata</i>	Zebra Finch				1			1	1	3
Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian Pipit								1	1
Bird Species per Site			7	4	12	18	10	10	16	38	48
MAMMALS											
Dasyuridae	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart			1	1			2		4
Dasyuridae	<i>Sminthopsis ooldea</i>	Ooldea Dunnart	2	1	1						4
Emallonuridae	<i>Saccolaimus flaviventris</i>	Yellow-bellied sheath-tailed bat								AN	1
Muridae	<i>Notomys alexis</i>	Spinifex Hopping-mouse	7	10	7	2	10			4	40
Muridae	<i>Pseudomys desertor</i>	Desert Mouse	4	5	4		4				17
Muridae	<i>Pseudomys hermannsburgensis</i>	Sandy Inland Mouse		2				3		1	6
Muridae	<i>Mus musculus</i>	House Mouse		1		3				1	5
Canidae	<i>Canis lupus</i>	Dingo								T	1
Felidae	<i>Felis catus</i>	Cat								T	1
Camelidae	<i>Camelus dromedarius</i>	Camel								T	1
Suidae	<i>Bos taurus</i>	Cattle								T	1
Vespertilionidae	<i>Chalinolobus gouldii</i>	Gould's wattled bat								AN	1
Mammal Species per Site			3	5	4	3	2	1	1	9	12
Mammal Abundance per Site			13	19	13	6	14	3	2		

Appendix F

Bat ID Report Rover 1 Project May 2011



Bat call identification from Tennant Creek, NT

Type: Bat Call Analysis

Prepared for: EcOz Environmental Services

Date: 4 July 2011

Job No.: SZ221

Prepared by: Specialised Zoological
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SUMMARY

Bat identifications from AnaBat echolocation call recordings are provided from the Rover project area, near Tennant Creek in the Northern Territory. Two species were identified unambiguously (Table 1).

Details supporting the identifications are provided, as recommended by the Australasian Bat Society (ABS 2006). A summary of pulse parameters is provided in Table 2, and representative call sequences are illustrated in Figure 1. Further data is available should verification be required.

METHODS

Signals as recorded with an AnaBat bat detector unit were supplied as downloaded sequences, which were examined in AnalookW 3.7w software. The frequency division ratio was set to a factor of 8. Three call variables were measured on good quality search phase pulses in representative call sequences: pulse duration (milliseconds), maximum frequency (kHz) and characteristic frequency (kHz). Species were identified based on information in Milne (2002). Nomenclature follows Armstrong and Reardon (2006).

REFERENCES

- ABS (2006). Recommendations of the Australasian Bat Society Inc for reporting standards for insectivorous bat surveys using bat detectors. *The Australasian Bat Society Newsletter* 27: 6–9. [ISSN 1448-5877]
- Armstrong, K. and Reardon, T. (2006). Standardising common names of bats in Australia. *The Australasian Bat Society Newsletter* 26: 37–42.
- Milne, D.J. (2002). *Key to the bat calls of the Top End of the Northern Territory*. Parks and Wildlife Commission of the Northern Territory, Technical Report No. 71.

TABLE 1. Species identifications, with the degree of confidence indicated by a code. Date correlates with site; see Table 2 for full species names.

	<i>C. gouldii</i>	<i>S. flaviventris</i>
Date		
Serial 1012		
16/05/2011	H	—
17/05/2011	H	—
18/05/2011	H	H
19/05/2011	H	—

Definition of confidence level codes:

H High. Unambiguous identification of the species at the site based on measured call characteristics and comparison with available reference material. Greater confidence in this ID would come only after capture and supported by morphological measurements or submission of a voucher/tissue specimen to a museum.

NC Needs Confirmation. Either call quality was poor, or the species cannot be distinguished reliably from another that makes similar calls. Alternative identifications are indicated in the Summary section of this report. If this is a species of conservation significance, further survey work might be required to confirm the record.

TABLE 2. Summary of variables from representative call sequences.

Species	s,p ¹	Duration (msec) ²	Max Frequency (kHz) ²	Char frequency (kHz) ²
Gould's wattled bat <i>Chalinolobus gouldii</i>	5,48	9.0 ± 2.1 5.1 – 16.0	44.0 ± 8.5 33.7 – 68.1	31.4 ± 1.4 28.7 – 34.2
Yellow-bellied sheath-tailed bat <i>Saccolaimus flaviventris</i>	1,5	18.0 ± 1.9 16.0 – 21.0	21.9 ± 0.4 21.4 – 22.3	17.7 ± 0.3 17.2 – 17.9

¹ s,p: number of sequences measured, combined total number of pulses measured;

² Mean ± SD; range.

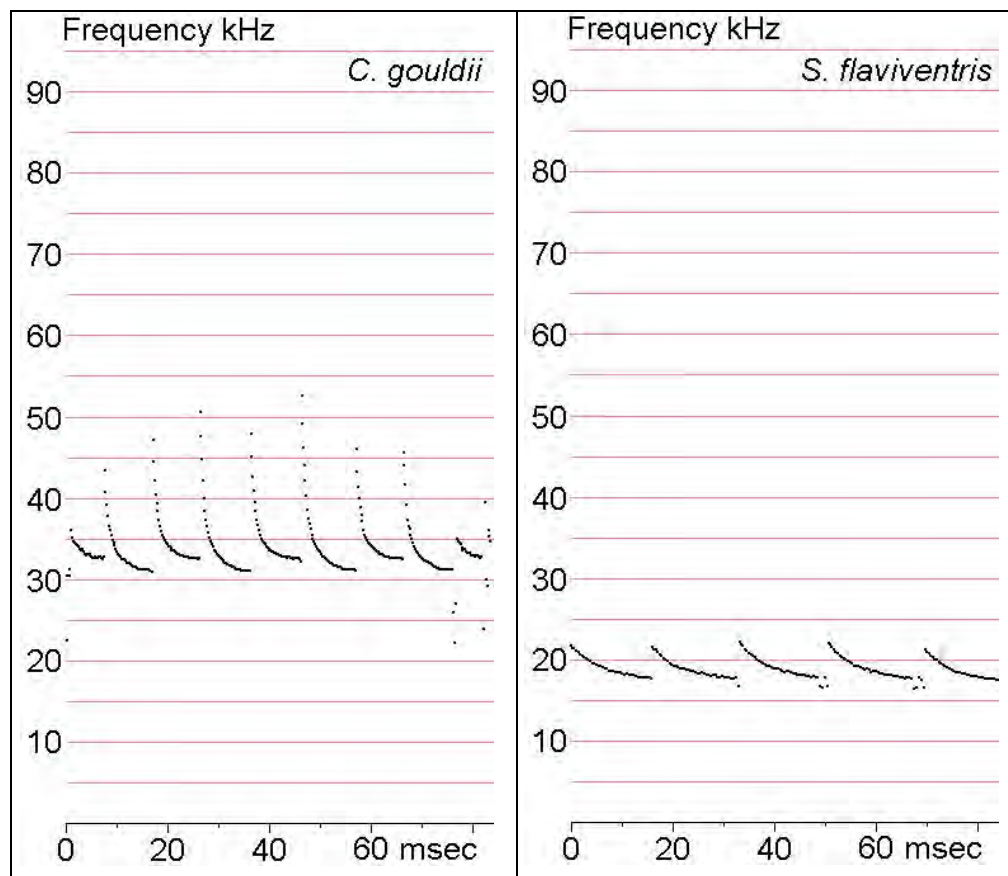


FIGURE 1. Representative call sequences of the species identified (time is compressed between pulses).

Appendix G

Selected Pictures from Survey (EcOz)

Rover 1 Project

May 2011

Appendix G: Selected Survey Pictures from May 2011 Rover 1 Survey (all photos by EcOz)





Long-nose Water Dragon *Lophognathus longirostris*



Military Dragon *Ctenophorus isolepis*



Panther Skink
Ctenotus pantherinus



Dwarf Bearded Dragon *Pogona minor*





Spotted Nightjar *Eurostopodus argus*



Striped-face Dunnart
Sminthopsis macroura



Short-tail Desert Mouse *Leggadina foresti*



Spinifex Hopping Mouse *Notomys alexis*



Desert Mouse *Pseudomys desertor*