

Appendix E

Fauna

Indicus Biological Consultants (2006), *Fauna survey of the proposed airstrip at Andranangoo Creek West (Matilda Minerals), Melville Island*, Report prepared for URS, Nightcliff, Darwin

Indicus Biological Consultants Pty. Ltd.



**Fauna Survey of the proposed airstrip at
Andranangoo Creek West (Matilda Minerals),
Melville Island**

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Contents

| | |
|---|-----------|
| Introduction..... | 3 |
| Methodology | 3 |
| Vertebrate fauna survey | 3 |
| Bird counts..... | 4 |
| Active Searches..... | 4 |
| Species of particular interest | 5 |
| Taxonomy and Nomenclature | 5 |
| Limitations | 5 |
| Relevant Literature | 5 |
| Results | 6 |
| Significant fauna species..... | 6 |
| Conservation significance of the area..... | 10 |
| Management recommendations for species of conservation significance | 12 |
| References | 13 |
| Appendix 1. Site photographs. | 15 |

Introduction

Indicus Biological Consultants Pty. Ltd. were commissioned by URS Pty. Ltd. to undertake a terrestrial vertebrate fauna survey of the area proposed as an airstrip on the Andranangoo Creek West mineral lease of Matilda Minerals Pty. Ltd. (Figure 1). Matilda Minerals Pty. Ltd. instigated and funded the development of this survey as part of its overall environmental program. Surveys were conducted to specifically target threatened species listed under the EPBC Act (Environment Protection and Biodiversity Conservation Act 1999); Butler's Dunnart, Hooded Robin, Masked Owl, Partridge Pigeon and Red Goshawk. In addition, Brush-tailed Rabbit-rats and the Brush-tailed Phascogale, both of which are listed under the TPWC Act (Territory Parks and Wildlife Conservation Act 2001) were targeted.

This document outlines the sample methodology and the results of the fauna survey conducted between the 25th and 28th of September 2006, and discusses potential impacts of the airstrip with regard to terrestrial vertebrate fauna species.

Methodology

Vertebrate fauna survey

Although the sampling methodologies suggested by the Biodiversity unit, NT Department of Natural Resources, Environment & the Arts (NRETA) suggest quadrat based sampling, transects were deemed more appropriate for the linear nature of this study site. However, all sampling methodologies (survey duration and other sampling strategies) follow these guidelines. Two 500 m transects were established in the approximate position of the proposed airstrip site (Table 1, Figure 1). Species seen in the general area that were not attributable to a transect were recorded as incidentals. Vegetation of this site consisted of eucalypt open forest, which is the dominant vegetation community on the Tiwi Islands and across the Top End (Woinarski *et al.* 2000; Woinarski *et al.* 2003). The eucalypt open forest consisted mainly of *Eucalyptus miniata*, *Eucalyptus tetradonta* and *Corymbia nesophila*. The area had been burnt during the current dry season (see Appendix 1).

Table 1. Location of transects (co-ordinates in UTM, WGS 84).

| | | Easting | Northing |
|-------------------|-------|----------------|-----------------|
| Transect 1 | Start | 700203 | 8742252 |
| | End | 700419 | 8742636 |
| Transect 2 | Start | 699883 | 8741834 |
| | End | 700146 | 8742184 |

Each transect consisted of six cage traps and 34 Elliott traps spaced equidistant along each transect. The transects were placed parallel with the road and were

baited with oats and peanut butter. Along each transect four pitfall traps with 10 m drift fences were placed within different microhabitats. All traps were open for 3 nights, with cage and Elliott traps checked and closed each morning and re-baited in the late afternoon.

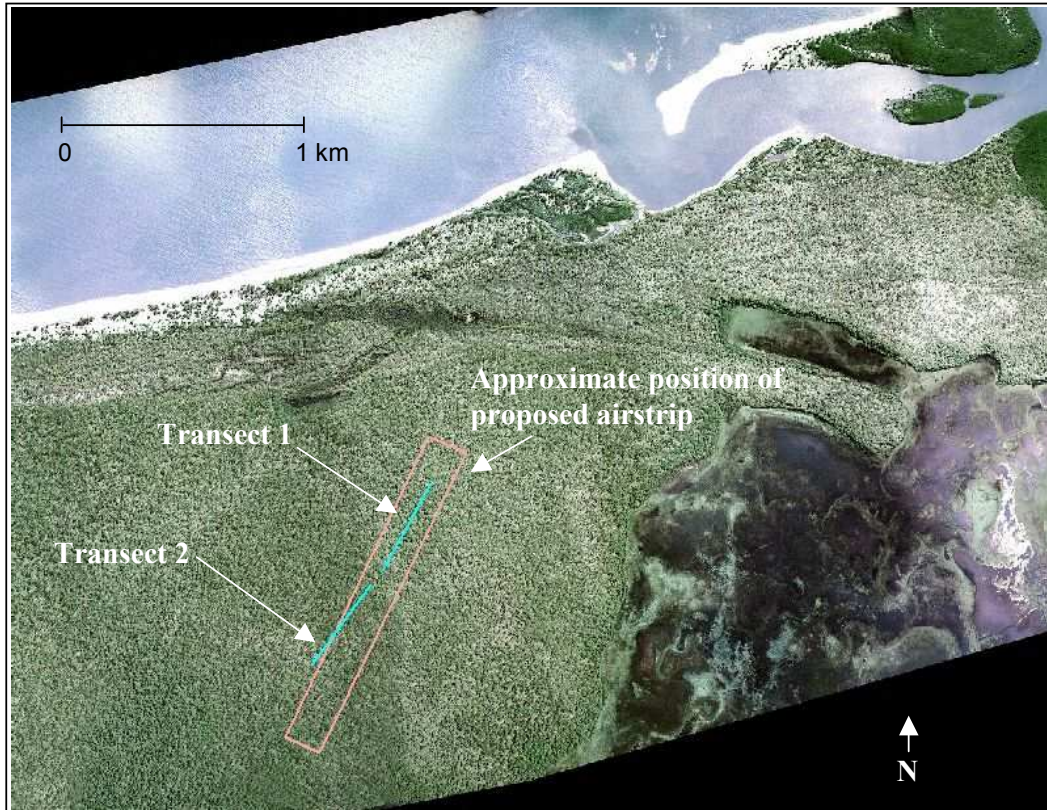


Figure 1. Approximate location of the proposed airstrip on the Andranangoo Creek West Mineral Lease, showing positions of the two transects

Bird counts

Along each transect an approximate area of 50 m either side of the transect was censused for birds three times in the morning and three times in the afternoon with an additional two nocturnal visits. Bird counts involved walking along the transects and recording all birds heard or observed in them. Birds flying overhead were not included and raptors were only included if observed overhead.

Active Searches

The area was actively searched eight times for reptiles, mammals, scats and signs. Each active search lasted for ten minutes and involved turning rocks and logs, raking through leaf litter, looking under bark, in crevices, etc. Six searches were conducted during the day (morning, midday and late afternoon) with an additional two searches at night using spotlights.

Species of particular interest

In addition to the transect-based survey, surveys were conducted to specifically target threatened species listed under the EPBC Act; Butler's Dunnart, Hooded Robin, Masked Owl, Partridge Pigeon and Red Goshawk. Active searches were made during the day for Red Goshawks, searching particularly for roosting and nesting sites. Concurrent with these searches were searches for the Tiwi Hooded Robin and Partridge Pigeon. Recorded calls of the Tiwi Hooded Robin were also broadcast in areas of open forest. Specific sampling for Masked Owls was undertaken by broadcasting their distinctive call in both transects, and along existing tracks at night. Additional spotlighting was carried out along existing tracks for Butler's Dunnarts, Brush-tailed Rabbit-rats and the Brush-tailed Phascogale, both of which are listed under the TPWC Act (2001).

Taxonomy and Nomenclature

Common and scientific names used in this report follow Strahan (1998) for mammals, Christidis and Boles (1994) for birds, Cogger (2000) for reptiles and Tyler and Davies (1986) for frogs.

Limitations

The survey is limited by its extent and the time period over which it was conducted. Cryptic and rare species may not have been recorded due to the relatively short sampling period, and further species may be detected if trapping were conducted over a longer period, or throughout different times of the year (particularly frogs, and migratory bird species). Although the survey was conducted during the late dry season it was believed all terrestrial vertebrate species of conservation significance likely to occur in the area could be detected at this time. The passing of Cyclone Ingrid over the study area in mid March 2005 resulted in the falling of many trees and the loss of branches from many standing trees. This was particularly obvious in the open forest communities and may also have influenced which species were recorded during this survey.

Relevant Literature

Relevant literature includes the *Territory Parks and Wildlife Conservation Act 2001* (Parks & Wildlife Commission of the Northern Territory 2001) and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth of Australia 1999) as well as the China-Australia Migratory Bird Agreement (CAMBA) 1987, the Japan-Australia Migratory Birds Agreement (JAMBA) 1974 and the Bonn Convention for the conservation of migratory species which came into effect in 1983.

Results

A total of six mammal species, 30 bird species and 10 reptile species were recorded during the survey (Table 2). The only introduced species recorded on site was the Asian Water Buffalo. This species is common on the Tiwi Islands and is hunted by the traditional owners of the area.

Significant fauna species

Brush-tailed Rabbit-rat

Some evidence suggests that the Brush-tailed Rabbit-rat (Figure 2) has suffered a recent decline, and it is now listed as Vulnerable in the Northern Territory (Woinarski 2000). The only known mainland populations to persist occur in Garig Gunak Barlu National Park (Cobourg Peninsula) and in a highly restricted area of Kakadu National Park (Firth 2003; Firth *et al.* 2005; Firth *et al.* 2006a). The population of Brush-tailed Rabbit-rats on the Tiwi Islands is one of three recognized subspecies (Kemper and Schmitt 1992).

Although having declined on the mainland of the Northern Territory the Brush-tailed Rabbit-rat is unusually abundant on the Tiwi Islands (Firth *et al.* 2006b). Extensive plantation development is now occurring on the Tiwi Islands, and is likely to expand considerably over the next few decades. This development targets the tallest and most well developed eucalypt forest environments, which are especially favoured by Brush-tailed Rabbit-rats, and much used by many other mammal species (Firth *et al.* 2006b).

Due to the small home range of this species (~ 1 ha) (Firth 2003; Firth *et al.* 2006a) the clearing of the eucalypt open forest that will be associated with the airstrip is likely to result in the loss of several individuals. However given the relatively small area (~12 ha) this is unlikely to have any significant impact on the overall population on Melville Island.

Table 2. Terrestrial vertebrate fauna species recorded in the area of the proposed airstrip.

Conservation status; *** Endangered (EPBC and NT), **Vulnerable (NT), J (JAMBA), B (BONN). # Indicates that a species was present.

| | Transect 1 | Transect 2 | Incidentals |
|--|---------------|---------------|-------------|
| Mammals | | | |
| Agile wallaby, <i>Macropus agilis</i> | # | # | |
| Brush-tailed Rabbit-rat, <i>Conilurus penicillatus</i> ** | # | # | |
| Common brush-tail possum, <i>Trichosurus vulpecula</i> | # | | |
| Northern Brown bandicoot, <i>Isodon macrourus</i> | # | | |
| Pale field rat, <i>Rattus tunneyi</i> | # | # | |
| Swamp buffalo, <i>Bubalus bubalis</i> | # | | |
| Birds | | | |
| Bar-shouldered Dove, <i>Geopelia humeralis</i> | # | # | |
| Blue-faced Honeyeater, <i>Entomyzon cyanotis</i> | # | | |
| Blue-winged Kookaburra, <i>Dacelo leachii</i> | # | # | |
| Brahminy Kite, <i>Haliastur indus</i> | | # | |
| Chestnut-breasted Mannikin, <i>Lonchura castaneothorax</i> | # | | |
| Forest Kingfisher, <i>Todiramphus macleayii</i> | # | # | |
| Grey-crowned Babbler, <i>Pomatostomus temporalis</i> | | # | |
| Grey Shrike-thrush, <i>Colluricincla harmonica</i> | # | # | |
| Large-tailed Nightjar, <i>Caprimulgus macrurus</i> | | | # |
| Leaden Flycatcher, <i>Myiagra rubecula</i> (B) | # | # | |
| Masked Owl, <i>Tyto novaehollandiae</i> *** | | | # |
| Northern Rosella, <i>Platycercus venustus</i> | | | # |
| Olive-backed Oriole, <i>Oriolus sagittatus</i> | # | | |
| Peaceful Dove, <i>Geopelia striata</i> | # | # | |
| Pheasant Coucal, <i>Centropus phasianinus</i> | | # | |
| Pied Butcherbird, <i>Cracticus nigrogularis</i> | | # | |
| Rainbow Bee-eater <i>Merops ornatus</i> (J) | # | | |

| | Transect 1 | Transect 2 | Incidentals |
|--|---------------|---------------|-------------|
| Red-winged Parrot, <i>Aprosmictus erythropterus</i> | | # | |
| Red-tailed Black-cockatoo, <i>Calyptorhynchus banksii</i> | # | | |
| Rufous Whistler, <i>Pachycephala rufiventris</i> | # | # | |
| Spangled Drongo, <i>Dicrurus bracteatus</i> | # | | |
| Silver-crowned Friarbird, <i>Philemon argenticeps</i> | | # | |
| Sulphur-crested Cockatoo, <i>Cacatua galerita</i> | # | # | |
| Tawny Frogmouth, <i>Podargus strigoides</i> | # | | |
| Varied Sittella, <i>Daphoenositta chrysoptera</i> | # | | |
| Weebill, <i>Smicronis brevirostris</i> | | # | |
| White-bellied Cuckoo-shrike, <i>Coracina papuensis</i> | | # | |
| White-throated Honeyeater, <i>Melithreptus albogularis</i> | | # | |
| Yellow Oriole, <i>Oriolus flavocinctus</i> | # | | |
| Yellow-rumped Mannikin, <i>Lonchura flaviprymna</i> | # | | |
| Reptiles | | | |
| Arboreal Snake-Eyed Skink, <i>Cryptoblepharus plagiocephalus</i> | # | # | |
| Bynoes Gecko, <i>Heteronotia bynoei</i> | # | # | |
| Douglas' Skink, <i>Glaphyromorphus douglasi</i> | | # | |
| Grey's Menetia, <i>Menetia greyii</i> | # | # | |
| Port Essington Ctenotus, <i>Ctenotus essingtonii</i> | | # | |
| Red-sided Rainbow Skink, <i>Carlia rufilatus</i> | # | | |
| Spotted Tree Monitor, <i>Varanus scalaris</i> | | # | |
| Storr's Snake-Eyed Skink, <i>Morethia storii</i> | # | # | |
| Striped Rainbow Skink, <i>Carlia munda</i> | # | # | |
| Two-Lined Dragon, <i>Diporiphora bilineata</i> | # | | |



Figure 2. Brush-tailed Rabbit-rat (Andranangoo Creek West).

Masked Owl

The Masked Owl *Tyto novaehollandiae melvillensis*, was recorded incidentally during this survey (Figure 3). It is listed as endangered under the EPBC Act and the TPWC Act. The Tiwi Island subspecies of Masked Owl was previously recognized as vulnerable, however recent analyses of its status undertaken by NRETA and the current Action Plan for Australian Birds has now listed it as endangered. This listing reflects the possible loss of prime habitat due to forestry operations (Woinarski *et al.* 2000; Woinarski *et al.* 2003).

Based on population densities recorded elsewhere in Australia from estimated home ranges of 5 – 10 km² (Kavanagh and Murray 1996) the total population of the Tiwi Islands sub-species was estimated at about 1000 mature birds (Garnett 2000). This species is believed to occur mainly in open forest, although it has been shown to roost and forage in a range of habitats (Kavanagh and Murray 1996, Woinarski *et al.* 2000). Clearing for the airstrip will reduce the available habitat for this species. Given the relatively small area this is likely to have little impact on the overall population.

Rainbow Bee-eater and Leaden Flycatcher

The Rainbow Bee-eater is listed under the JAMBA (1974) agreement, where as the Leaden Flycatcher is listed under the Bonn Convention (1979). The Rainbow Bee-eater and Leaden Flycatcher are birds of a range of habitats. Given that these species are common on the Tiwi Islands (Woinarski *et al.* 2003) and throughout Australia it is extremely unlikely that clearing of eucalypt

open forest for the proposed airstrip will have a significant impact on these species in the local area or in a broader context.

No significant roosting, nesting or breeding sites were located during this survey.



Photo: Ron Firth

Figure 3. Masked Owl (Andranangoo Creek West).

Conservation significance of the area

Open forest is a very widespread vegetation community on the Tiwi Islands and across the Top End (Woinarski *et al.* 2000; Woinarski *et al.* 2003). Although three species of conservation significance were recorded on the site, and one adjacent (Masked Owl), the area to be cleared for the airstrip (~12 ha) represents a very small proportion of this community and therefore will not significantly affect their (local or regional) conservation status. However, there are many steps Matilda can take to avoid further loss of habitat and fauna;

- Design all operations such that clearing of native vegetation is kept to a minimum (this can be achieved by clearly demarcating areas to be retained by brightly coloured tape or the installation of temporary fencing prior to any works),
- Avoid the widespread dumping of sand/soil and other materials from mine activities. This will aid in maintaining the ecological values of remnant native vegetation throughout the site.

- Select and clearly define an area (areas) within the mine lease for future deposition of all rubbish and soil. This site (sites) should be located away from any area that supports native trees or other native vegetation.
- Do not place stockpiles of materials including grass clippings within any area that supports native trees or other native vegetation.
- Develop and implement a fire management plan, which should include appropriate fire regimes that will minimize the impacts of fire on the open forest of the site. The management plan should take into account the necessity for early dry season fires that are of low intensity and on a small scale, to create a spatial diversity of habitat structures.
- Minimise the creation of access points into nearby streams through mangroves, with particular attention paid to future erosion of the surrounding area, which can be caused by loose soils particularly when under the influence of large tidal regimes.
- Any outflow of wastewater into mangroves or surrounding streams should be avoided. Such management practices lead to the slow but steady degradation of aquatic ecosystems via silt build up, increased nutrient load and potentially higher water volumes.
- Minimise disturbance to native vegetation. Spread of introduced weed species can be facilitated by disturbances such as land clearance, and construction works (particularly by using machinery that are carrying weeds from other areas).
- Monitor all management actions, notably weed control. Changes in vegetation condition should be used to guide future management decisions. Establishment of permanent photo points is a simple method of monitoring such changes.

Other potential threats to fauna biodiversity associated with the proposed airstrip include the introduction of exotic weed and animal species, including weeds (such as Gamba grass) and introduced fauna such as ants (see Andersen and Woinarski 2003) and cane toads. Because the total impact from these species is difficult to determine (and potentially quite large), every effort should be made to monitor and manage these sites for weeds and introduced fauna throughout the life of the mine. Weed species of greatest concern are those that have the potential to alter the environment (i.e. transformer species). Of most concern in the Top End are those species with the potential to alter fire regimes by increasing the fuel load, potentially killing seedlings and preventing the regeneration of native species (Rossiter *et al.* 2003). The long-term results of this impact are a transformation of open forest and woodland to grassland. In the Top-End these species are Gamba Grass, *Andropogon gayanus*, Mission Grass, *Pennisetum polystachion*, and Annual Pennisetum, *Pennisetum pedicellatum*.

Management recommendations for species of conservation significance

The above recommendations will aid in the conservation of threatened species throughout the lease, however more specific actions include;

- A register of significant fauna that may, from time to time be encountered within the study area should be maintained. Matilda staff should be notified of the importance of recording such fauna in the register. This register could be made available to NRETA, only if fauna are obviously resident (breeding or foraging). Transitory species, such as White-bellied sea-eagles, should be recorded on the register as sightings but not reported to NRETA unless these species take up residence. It should be noted the majority of species are nocturnal and sometimes difficult to identify, however, distinctive species such as the Masked Owl (which has a distinctive call) can be monitored in this way.
- An undertaking has been made by Matilda Minerals to monitor the population of the endangered Masked Owl in the vicinity of the mine. This may provide some information on this little known species, as there is currently little knowledge of the species movements/ habitat requirements.

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Appendix 1. Site photographs.



Eucalypt open forest at the southern end of proposed airstrip.



Eucalypt open forest at the northern end of proposed airstrip.