Northern Quoll Desktop Review – Pilbara Bioregion

Summary Report

1. INTRODUCTION

To help inform species distribution mapping a desktop review of grey and published literature was undertaken to locate and collate historical records of threatened species occurring in the Pilbara bioregion focusing primarily on the northern quoll *Dasyurus hallucatus.* Other threatened species recorded included the bilby, mulgara, western pebble-mound mouse, spectacled hare-wallaby, northern marsupial mole, Pilbara leaf-nosed bat, ghost bat, Pilbara olive python and night parrot. Reports of Rothschild's rock-wallaby were also recorded.

Details of records including location, habitat descriptions, survey methodology and effort, and any available information on abundance were collated in a spreadsheet and a bibliography of survey reports compiled.

2. METHODS

2.1. Information sources

- Electronic searches of library catalogues and/or databases were performed at the Department of Environment and Conservation's (DEC) Conservation Library (Woodvale, now relocated to Kensington), the Environmental Management Branch Library (Kensington) and the Environmental Protection Authority Library (Atrium Building, Perth). Physical searching through shelf collections at all libraries was also required as these electronic searches were limited by search terms and did not identify all relevant material that was held.
- Internet searches were conducted to locate reports posted by mining companies with operations in the Pilbara.
- Reference lists included in reviewed reports were used to identify additional information sources. Lists were compiled and requests to provide documents or other information were submitted to the relevant consultancies, mining companies and government departments.
- Wildlife license application lists were provided by the DEC Species & Communities Branch, who also allowed access to hardcopy files of licence applications and fauna returns records.
- NatureMap was searched for northern quoll records that may not have been capture through other search methods.

2.2. Report reviews

All relevant documents that were located were recorded in a spreadsheet. Positive (capture or evidence indicating presence) and negative survey results were recorded for northern quolls. Only positive results were entered for all other species. Details of survey location, date, sampling methodology, and habitat descriptions were recorded if this information was presented in the reports.

2.3. DEC Licensing data searches

Lists of over 4,000 fauna (SF) licences issued between 2003 and 2010 were searched for relevance. These were shortlisted to more than 270 licences issued for fauna surveys targeting mammals in the Pilbara region. Hard copy licence application files were searched to retrieve details of sampling methodology, specific survey locations and dates, and fauna survey returns. Results were cross-referenced with reports to avoid multiple reporting of the same records.

2.4. NatureMap

DEC,s NatureMap database was searched for any northern quoll records from fauna returns submitted prior to 2009. Records since 2009 have been electronically submitted by the licensee and were provided as a spreadsheet by DEC Species & Communities Branch. Results were cross-referenced with reports in an attempt to avoid multiple reporting of the same records.

2.5. Record locations and preliminary mapping

Coordinates for the locations of northern quoll records obtained from reports were converted to decimal degrees and entered into a Google Earth image to identify patterns in distribution. When specific locations of record were not presented in the reports a location reference was used for the general survey area (Attachment A). For the purpose of preliminary mapping if multiple records were presented from a survey area a location reference was also used.

3. RESULTS

3.1. Literature reviewed

All literature search methods resulted in just over 200 reports for review (Attachment A). The balance of the documents located (>200) did not contain detailed or relevant information for the purposes of this review (e.g. either no survey information was included, they were desktop reviews only and/or based on data captured from other reports).

The majority of documents that yielded relevant information were consultant's survey reports prepared for mining companies, some of which were attachments or appendices to EIA, EMP or PER documents.

3.1.1. Sampling methods and effort

The majority of surveys used trapping arrays consisting of pitfalls and medium (size) Elliot traps, generally 25 traps at 10 m spacing. Only 40 surveys included cages traps, which were limited to 1 or 2 per trapping site. Eighteen surveys were noted to have adopted the CALM standard Pilbara trapping grid format (10 pitfalls plus 20 medium Elliot traps set in 4 lines of 5 traps 25m apart). Surveys were not restricted to cool weather and were conducted throughout the year. Some surveys were sampled during multiple phases or on a seasonally basis.

3.1.2. Records from reports and other literature

Northern quolls were recorded in only 40 of over 200 reviewed documents that reported survey results (Table 1). Only 22 records were actual captures. Records

included direct observations such as sightings and road killed individuals, evidence of presence such as track, scats, bones etc, and one record using motion sensor camera equipment (Table 2).

Table 1: Number of records for Pilbara threatened species located in reports

Species	Common name	Records
Dasyurus hallucatus	Northern quoll	40
Macrotis lagotis	Bilby	6
Lagorchestes conspicillatus	Spectacled hare-wallaby	0
Dasycercus cristicauda	Mulgara	10
Pseudomys chapmani	Ngadji / Western pebble-mound mouse	83
Notoryctes caurinus	Karkarratul/Northern marsupial Mole	1
Rhinonicteris aurantia (Pilbara form)	Pilbara leaf-nosed Bat	10
Macroderma gigas	Ghost bat	18
Liasis olivaceus barroni	Pilbara olive python	18
Petrogale rothschildi	Rothschild's rock-wallaby	30
Pezoporus occidentalis	Night parrot	0

Table 2: Type of northern quoll records reported

Record Type	Number of Reports
Captures	22
Sightings	5
Tracks	6
Scats	16
Road kill	3
Skull	1
Owl pellet containing remains	1
Motion camera record	1
Recently active den (?)	1
Unspecified	3
Total	59*

* More than one record type was reported in 14 of the 40 records

Only two reports with positive quoll records were located from the decade 1970-19, three from 1980-89 and eight 1990-99. A total of 29 reports with positive records were located from 2000 to 2010, with seven of these being from 2008. Not all captures were quantified and very few provided details of individual animals captured.The highest number of captures was reported in 2010 (Table 3).

Table 3: Reports recording a relatively high (> 10) number of northern quoll captures

Report Record No.	Date of Survey	Captures Reported	Location	Author
49	1991	> 30	Robe River near 14 km SW of Pannawonica - Mesa J project	ecologia (1991)
60	1988-90 (9 surveys)	11	Abydos-Woodstock Reserve	Western Australian Museum (1991)
61	1987	20	West Pilbara - Mungowarra Pool on the Fortescue River	King, D.R. (1987)
76b	2005	18	Callawa - NE Pilbara near Yarri and Nimingarra	ecologia (2005)
104	2008	21	Sites around Quarry 1 and 2 (BHP Rail), but not within 3km and no further than 20 km away	Ecologia (2009)
172	2010	124 captures (36 individuals)	Poondano Project Area - 20 km SE of Port Hedland	Rapallo (2010)

3.2. Licensing Data

All search methods relating to licensing applications and fauna returns submitted prior to 2009 resulted in only five new records. (This does not include Threatened Fauna and WA Museum database records).

From a shortlist of 270 a total of 132 licence applications were sighted and 57 could be matched with consultant's reports. Only 21fauna returns could be located in hard copy files and provided four northern quoll records, only 1 record had not been captured from report reviews (Table 4; Attachment B).

Electronic fauna returns data (2009-10) provided 4 new records not yet presented in reports (Table 4; Attachment C).

Table 4: Number of records obtained from licensing data.

Data source	**Total records** (not individual captures)	**New records**
Hard copy licence files	4	1
Electronic return records	10	4
NatureMap – Threatened Fauna Database	64	-
NatureMap – Museum Specimen Database	41	-

3.3. Record locations and preliminary mapping

A total of 63 record locations were obtained, converted to decimal degrees (Attachment F) and mapped using Google Earth (Attachment G). In a number of cases locations were given for multiple captures or a combination of record types (e.g. capture, sighting, tracks etc.). If more than three locations were given a page reference for the report document is included in the spreadsheet and refers to a list of coordinates and one general reference location is used for mapping.

4. CONCLUSIONS

These results indicate that northern quolls may not be as abundant in the Pilbara as previously and commonly suggested. However, record searches were limited by what information could be identified, and what was available and accessible. Therefore the resulting records are not as comprehensive as hoped.

When interpreting these results the following should be considered:

- Many of the records only indicate presence and do not include quantitative data. Therefore abundance cannot be estimated. For example some reports only list northern quolls as fauna occurring at the site while others provided details of single or multiple captures. If captures are recorded they are generally listed as the number of captures for the survey and not the number of individual animals.
- Sampling methods and effort vary and many surveys were not adequate to detect quolls. Therefore reports that did not record the presence of quolls should not be interpreted as an absent of quolls from those survey areas.
- It is anticipated that the results of searching fauna licence return records and NatureMap are not comprehensive considering the limited number of fauna returns located in hard copy. NatureMap fauna records are not current and are due to be updated in early 2011.
- Although advanced access to NatureMap data was granted, record details are limited, making it difficult to identify new records that had not been captured elsewhere. Therefore it is possible that records are replicated in the Threatened Fauna and Museum Specimen database entries, and reports.

The observed increase in the number of reports located is most likely indicative of an increase in consultant's reports being generated during the past decade due to an increase in mining development and associated environmental reporting. For example the prominent linear cluster of record locations on the Google image overlies the

BHPBIO rail corridor where regular survey and monitoring is conducted. That higher numbers of quolls than previously reported have been captured recently south of Port Hedland is most likely the result of modified sampling methodology to target northern quolls since their listing in 2004.

The majority of fauna surveys were conducted on land under mining lease. Therefore it is possible that quolls still occur in suitable habitat outside mining developments and have not been detected due to lack of survey work outside these areas.

Implementing the proposed monitoring program in 2011 will provide much needed baseline data and a clearer picture of the distribution and condition of northern quoll populations in the Pilbara.

5. BIBLIOGRAPHY

See Attachment D.

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* Contact details are provided in Attachment E.

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Lisa Wright	Librarian, Conservation Library

7. List of attachments

Attachment A: Pilbara Fauna Records – list of reports reviewed

Attachment B: Northern Quoll Records from Licence Searches

Attachment C: Summary of NatureMap and Electronic licence return data – includes coordinates for location of captures etc.

Attachment D: Bibliography – all reviewed documents

Attachment E: Contacts – list of contacts who assisted with obtaining reports and records

Attachment F: Quoll record coordinates – from reports, converted

Attachment G: Map of record locations – Google Earth image showing location of records.