Rapid Growth Project 5

Targeted Northern Quoll Survey
Quarry 1, 2, 4 and East Turner River

Providing sustainable environmental strategies,
management and monitoring solutions
to industry and government.
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1 INTRODUCTION

BHPBIO is one of the world’s leading producers of iron ore, with seven mining operations in the Pilbara region of north-western Australia producing over 100 million tonnes of iron ore per annum. BHPBIO is currently implementing a range of projects to expand the capacity of its iron ore operations in the Pilbara, including an expansion of the capacity of the Newman to Port Hedland railway line.

The 426 km railway line from Newman to Port Hedland, known as the Mainline, is used to transport iron ore from mines at Mt Whaleback and Ore bodies 23, 25 and 29 to Port Hedland. The Mainline and rail spurs currently consist of a single track with passing sidings spaced at approximately 15-20 km intervals. The Mainline was constructed in the late 1960’s and additional sidings have been progressively constructed to increase the capacity of the railway.

Additional rail capacity is an essential element in BHPBIO’s expansion program and plans are currently in place to duplicate approximately 307 km of the existing rail network.

The project will require utilisation of several quarry leases located adjacent to the railway for laydown and as sources of construction material. The quarries were established in the 1960s as sources of rock for construction and maintenance of the Mainline. The quarries have been inactive for the last 10 years, however BHPBIO propose to redevelop the sites to obtain construction materials and for construction of site offices and laydown. Areas suitable for use as laydown and site offices on BHPBIO tenure are limited along the Newman to Port Hedland railway, as the Mainline lease is only 80 m wide.

During initial fauna surveys conducted along the rail corridor (ecologia 2008a, b), Northern Quolls (Dasyurus hallucatus) were trapped by ecologia field staff in two quarries close to the rail corridor and broken rock piles within the quarries where scats were present were identified as probable quoll den sites. These quarries are located in the northern section of the rail corridor on the Abydos Plain of the Pilbara bioregion.

1.1 ASSOCIATED LITERATURE

Records of the Northern Quoll are broadly distributed across the Pilbara region of the Interim Biogeographic Regionalisation of Australia (Thackway and Cresswell 1995). Northern Quolls have recently been recorded at the BHPBIO Goldsworthy minesite (32 individuals) (ecologia 2006), and Callawa exploration area (16 individuals) (ecologia 2005), both approximately 175 km E of Port Hedland, and at the Moly Mines Spinifex Ridge minesite (6 individuals), approximately 50 km NE of Marble Bar (Outback Ecology 2006). Records of the Northern Quoll on the Abydos Plain, including the records in the vicinity of the BHPBIO railway (ecologia 2008a; ecologia 2008b), and locations recorded in DEC databases for the area 100 km either side of the BHPBIO rail corridor, are illustrated in Figure 1.1, and include:

• Level 2 fauna surveys for the FMG Rail corridor recorded scats of the species on several granite outcrops in the vicinity of quadrat FMG105 (Biota 2004).

• Eight individuals were recorded on the Hope Downs Rail Corridor fauna survey (Hope Downs PER, 2002), including sites HAE6E and HAE9 in granite outcrops (Biota 2004). Northern Quolls were sighted at East Turner River and Coonarrie Creek (site HDD105) (Biota 2004).

• Within the Abydos-Woodstock Reserve one individual was trapped at Cadjeput Gorge, a steep-sided ravine with permanent pool, and 10 individuals were trapped at Tim Ealey Hill, an extensive granite tor (How et al. 1991).

Since the initial detection of Northern Quolls in two quarries along the BHPBIO railway (ecologia 2008a; ecologia 2008b) a management plan has been developed to address
potential impacts cause by the development of the project (ecologia 2008c). Identified in the management plan is the need to determine the extent of Northern Quoll's along the rail corridor.

In order to investigate the occurrence and distribution of Northern Quolls along the BHPBIO rail line, additional targeted searches for evidence of Northern Quolls were conducted at Quarries 1, 2, and 4 and East Turner River on the 14 and 15 July 2008 by two zoologists with previous experience in the trapping and relocation of the species. The objective of this survey was to determine whether probable den locations for the animals were located within the quarry leases, particularly in areas earmarked for development as part of the rail duplication works. This report outlines the results of this additional targeted survey in order to supplement what is already known about the regional quoll distribution and to assist with BHPBIO’s management strategy.
2 METHODS

The survey comprised searches for individuals and tracks, scats and other traces of Northern Quolls at Quarries 1, 2 and 4. The aim of the survey was to determine whether Northern Quolls (previously recorded at Quarry 1 and Quarry 3) were also present at Quarries 2 and 4, and to document the distribution of probable den locations (if present) within Quarries 1, 2 and 4. The area associated with the intersection of the rail lease and East Turner River was also examined for evidence of Northern Quolls. The methods used at each location are described in detail below. At all locations, hollow timber, rockpiles (natural and artificial), ant and termite mounds and burrows left by ground dwelling animals such as varanid lizards were closely examined for evidence of Northern Quoll activity and residence.

2.1 QUARRY 1

Quarry 1 was surveyed on 14 July. Transects were walked across the entire quarry lease at a spacing no greater than 25 m apart. Particular attention was paid to a small natural rocky outcrop located immediately north-west of the quarry pit.

2.2 QUARRY 2

Quarry 2 was surveyed on 15 July. Due to time constraints the entire Quarry 2 lease could not be surveyed and transects were therefore concentrated in the areas of the quarry most likely to be used for future BHPBIO works. These areas included the quarry pits (which included standing water), the access road and the low acacia sandplain to the south and west of the quarry pits. Transects were walked at 50 m intervals across these areas. The zoologists surveyed more intensively at the following areas:
- natural granite area east of the quarry pits;
- the boulder scree within the quarry pits;
- isolated boulder piles near the pits; and
- the rocky scree surrounding standing water in the quarry pits.

2.3 QUARRY 4

Quarry 4 was surveyed on 14 July. The large size of the quarry lease meant that wider-spaced transects of up to 100 m apart were walked across the lease. Particular attention was paid to areas of natural granite boulders, scree and exposed rock to the east of the quarry pit. In addition, ten Elliott traps baited with universal bait (which has previously proved highly attractive to Northern Quolls) were set up for one night around the rim of the quarry pit which had standing water and was thought to be the area of greatest likelihood for Northern Quoll activity.

2.4 EAST TURNER RIVER

The rail duplication will require a new dual-track rail bridge to be built at East Turner River. The bridge footprint and the rail lease where these overlay the riverine habitat of the East Turner River were intensively searched for Northern Quoll signs over a 1 hr period on 14 July.
3 RESULTS

Evidence for Northern Quolls was found at sites within each of the quarry leases, and recent activity was also evident at East Turner River. Results for individual locations are presented below and summarised in Table 3.1.

Table 3.1 – Summary of Northern Quoll scat, track and individual records

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>Zone</th>
<th>Easting</th>
<th>Northing</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quarry 1</td>
<td>Tracks</td>
<td>50 K</td>
<td>671981</td>
<td>7728880</td>
<td>Tracks observed to the S of the quarry.</td>
</tr>
<tr>
<td>Quarry 1</td>
<td>Scats</td>
<td>50 K</td>
<td>671927</td>
<td>7729163</td>
<td>Quoll scats and probable den site in natural granite 50 m NE of quarry.</td>
</tr>
<tr>
<td>Quarry 2</td>
<td>Scats</td>
<td>50 K</td>
<td>675113</td>
<td>7685730</td>
<td>2 fresh scats, 2 old scats and probable den sites near standing water close to quarry pits.</td>
</tr>
<tr>
<td>Quarry 2</td>
<td>Scats</td>
<td>50 K</td>
<td>675301</td>
<td>7685704</td>
<td>1 fresh scat, 1 older scat. 5m away from artificial rock pile with probable den site, 40m SE of the quarry pits.</td>
</tr>
<tr>
<td>Quarry 2</td>
<td>Scats</td>
<td>50 K</td>
<td>675419</td>
<td>7685699</td>
<td>Scats on natural granite adjacent to probable den site 150m E of the quarry pits.</td>
</tr>
<tr>
<td>Quarry 2</td>
<td>Individual</td>
<td>50 K</td>
<td>675147</td>
<td>7685649</td>
<td>1 individual sighted immediately S of standing water.</td>
</tr>
<tr>
<td>Quarry 4</td>
<td>Scats</td>
<td>50 K</td>
<td>707987</td>
<td>7559352</td>
<td>Quoll scats (old) on natural granite 750m E of quarry pit.</td>
</tr>
<tr>
<td>Quarry 4</td>
<td>Tracks</td>
<td>50 K</td>
<td>708504</td>
<td>7568440</td>
<td>Quoll tracks adjacent to airstrip 1.2km E of quarry pit</td>
</tr>
<tr>
<td>E. Turner R</td>
<td>Scats</td>
<td>50 K</td>
<td>674348</td>
<td>7703085</td>
<td>Quoll scats where feeding on dead Corella but no probable den site.</td>
</tr>
<tr>
<td>E. Turner R</td>
<td>Tracks</td>
<td>50 K</td>
<td>674281</td>
<td>7703132</td>
<td>Quoll tracks extensively found in the area either side of the bridge extension.</td>
</tr>
</tbody>
</table>

All GPS Co-ordinates are in GDA94.

3.1 QUARRY 1

Much of the lease contained habitat that was thought to be unsuitable for Northern Quolls, with the only area of potentially suitable habitat being the low granite ridge into which the quarry had been cut and the rocky scree slope surrounding the standing water in the quarry pit. Despite this, tracks and scats were also found away from the quarry pit (Figure 3.1), suggesting that the area is generally utilised for foraging, but not necessarily for denning as no den locations within the quarry were found. During a previous survey by ecologia in May 2008, four individuals were captured on the rocky scree surrounding the standing water in the quarry, after numerous scats had been found at the location. The observation of tracks during the current survey suggests that quolls are still present.

Northern Quolls are thought to utilise both Quarry 1 and the surrounding lease area as foraging habitat and may den in suitable locations within the lease.

3.2 QUARRY 2

Four records of Northern Quoll were made within the lease. Scats were located in natural granite associated with a probable den site 150 m east of the quarry pits, adjacent to the access track and standing water (two fresh and two old scats) and near an artificial rock pile 40 m south-east of the quarry, which also had a probable den site. An individual was observed immediately south of the rocky scree slope surrounding standing water located to the south of one of the quarry pits.
The observation of an individual confirmed that quolls were present at the time of survey and the species is likely to den and forage within the lease.

### 3.3 QUARRY 4

No signs of Northern Quoll activity or den sites were observed in areas proposed to be re-developed by BHPBIO within Quarry 4. Old scats were located at an area of natural granite several hundred metres to the east of the quarry pit and recent tracks were observed adjacent to the airstrip more than a kilometre east of the quarry pit. The presence of tracks within the lease suggests that quolls were present during the survey, but the lack of scats or tracks and the absence of captures in the Elliott traps surrounding the quarry pit suggest that quolls were absent during the survey within the area proposed to be re-developed.

Northern Quolls are unlikely to den, but may forage within the lease.

### 3.4 EAST TURNER RIVER

Numerous recent Northern Quoll tracks were observed in the sandy creekbed within the rail lease at the intersection of the rail line and the East Turner River. A Quoll scat was located beneath the existing bridge where a quoll had been feeding on the carcass of a Little Corella. No den locations were found in this area.

Northern Quolls forage within the lease, but are unlikely to den there due to a lack of suitable habitat.
Figure 3.1 – Quarry 1
Figure 3.2 – Quarry 2
Figure 3.3 – Quarry 4
Figure 3.4 – East Turner River

Survey Boundary
- Northern Quoll Record
*Tracks were recorded across much of the survey area

Scats and Prey Remains
- Tracks
4 CONCLUSION

The Quarry sites represent man-made landforms which appear to be suitable for the activity and residence of Northern Quolls in addition to their natural habitat surrounding these quarries. This targeted survey demonstrated that Northern Quolls are present at scattered locations along the BHPBIO rail corridor between Quarry 1 and Quarry 4. Potential impacts caused by the development of the project have been identified and addressed in the Northern Quoll management plan (ecologia 2008c).

Although there are previous records of Northern Quoll in surrounding areas of the Abydos plain, particularly associated with natural granite rockpiles (tors), the extent to which the quarry and river sub-populations interact with each other is unknown and it is not possible to determine whether they represent discrete populations. Knowledge of Northern Quoll movements and activity patterns in the Pilbara is limited, but males have been known to travel 3.5 km over 7 days (King 1989) suggesting that there is potential for gene flow between individuals 3 km apart.

The distances between the locations described in this report are significantly greater than 3 km and an additional survey in the wider areas surrounding each of the quarries may determine whether there is the potential for genetic continuity between populations.
5 REFERENCES


