
8.1 Existing Conditions

8.1.1 Species present

As part of the PER study, URS commissioned fauna surveys of the Princess Louise and North Point mine areas and associated access roads. The work was undertaken by biological consultants (Indicus), and arrived at the following key findings:

Princess Louise

Four species of mammal, 17 birds, eight reptiles and three amphibian species were recorded during the surveys (Indicus 2007). Cane toads were the only feral animals recorded at this site. A full species listing is provided in Table 8.1.

Due to previous land clearing for exploration purposes, the fauna surveys were undertaken along the edges of the tenement in sections of remnant vegetation, as indicated by the transect lines in Figure 8.1. While it is noted that the conceptual mine layouts affect areas to the north of these transects, the habitat types and vegetation communities north and south of the mine are comparable.

Princess Louise access road

Eleven species of birds were recorded during surveys (Indicus 2007).

North Point

Six species of mammal, 31 birds, six reptiles and two amphibian species were found during surveys (Indicus 2007). Feral donkeys were recorded at this site. A northern quoll was recorded at North Point mine site (see Figure 8.2).

Similar to Princess Louise, previous land clearing for exploration purposes meant that the surveys were conducted on the periphery of the tenement where native vegetation still exists. In this case, the transects correspond closely with areas of proposed land disturbance.

North Point access road

Three species of mammal, 27 birds and two amphibian species were recorded during surveys (Indicus 2007). This included a colony of ghost bats, living in an old mine adit (location shown in Figure 8.2). It is noted that this access road survey was based on a conceptual road alignment, which has now changed. The haul road was initially proposed to exit the mine site to the east, but is now planned to run south to Grove Hill Road. The Flora and Fauna Report for the project sites, presented in Appendix B, refers to the initial road alignment.

A complete list of fauna recorded at all the survey sites is presented in Table 8.1. The locations of transects used for surveys in the mine sites areas are presented in Figures 8.1 and 8.2. Targeted surveys for the gouldian finch were conducted but did not result in any sightings of the species.



Table 8-1 Fauna recorded at North Point and Princess Louise sites

Species	Princess Louise	North Point	North Point Access	Princess Louise Access
Mammals				
<i>Dasyurus hallucatus</i> , northern quoll		X		
<i>Sminthopsis virgatae</i> , red-cheeked dunnart		X		
<i>Isodon macrourus</i> , northern brown bandicoot		X		
<i>Macropus antilopinus</i> , antilopine wallaroo	X	X	X	
<i>Macroderma gigas</i> , ghost bat			X	
<i>Mesembriomys gouldii</i> , black-footed tree-rat	X	X		
<i>Zyzomys argurus</i> , common rock-rat	X			
<i>Rattus tunneyi</i> , pale field rat	X			
<i>Equus asinus</i> , donkey *		X	X	
Birds				
<i>Haliastur sphenurus</i> , whistling kite		X	X	
<i>Falco berigora</i> , brown falcon		X	X	
<i>Falco cenchroides</i> , nankeen kestrel	X			
<i>Falco subniger</i> , black falcon		X		
<i>Accipiter fasciatus</i> , brown goshawk		X		
<i>Geopelia humeralis</i> , bar-shouldered dove		X	X	
<i>Geopelia striata</i> , peaceful dove		X		X
<i>Phaps chalcoptera</i> , common bronzewing		X		
<i>Trichoglossus haematodus</i> , rainbow		X	X	



Species	Princess Louise	North Point	North Point Access	Princess Louise Access
lorikeet (J)				
<i>Aprosmictus erythropterus</i> , red-winged parrot		X		
<i>Platycercus venustus</i> , northern rosella			X	
<i>Melanodryas cucullata</i> , hooded parrot	X	X		
<i>Cacomantis variolosus</i> , brush cuckoo			X	X
<i>Chrysococcyx basalis</i> , Horsfield's bronze-cuckoo			X	
<i>Centropus phasianinus</i> , pheasant coucal		X	X	X
<i>Eurostopodus argus</i> , spotted nightjar		X		
<i>Merops ornatus</i> , rainbow bee-eater			X	
<i>Malurus melanocephalus</i> , red-backed fairy-wren		X	X	X
<i>Pardalotus striatus</i> , striated pardalote	X			
<i>Smicromnis brevirostris</i> , weebill	X	X	X	
<i>Philemon argenticeps</i> , silver-crowned friarbird		X	X	
<i>Philemon citreogularis</i> , little friarbird	X	X	X	X
<i>Lichmera indistincta</i> , brown honeyeater			X	
<i>Lichenostomus unicolour</i> , white-gaped honeyeater			X	
<i>Lichenostomus virescens</i> , singing honeyeater		X	X	
<i>Melithreptus albogularis</i> , white-throated honeyeater	X	X	X	X
<i>Pomatostomus temporalis</i> , grey-crowned babbler	X	X	X	X
<i>Colluricincla harmonica</i> , grey shrike-thrush		X	X	



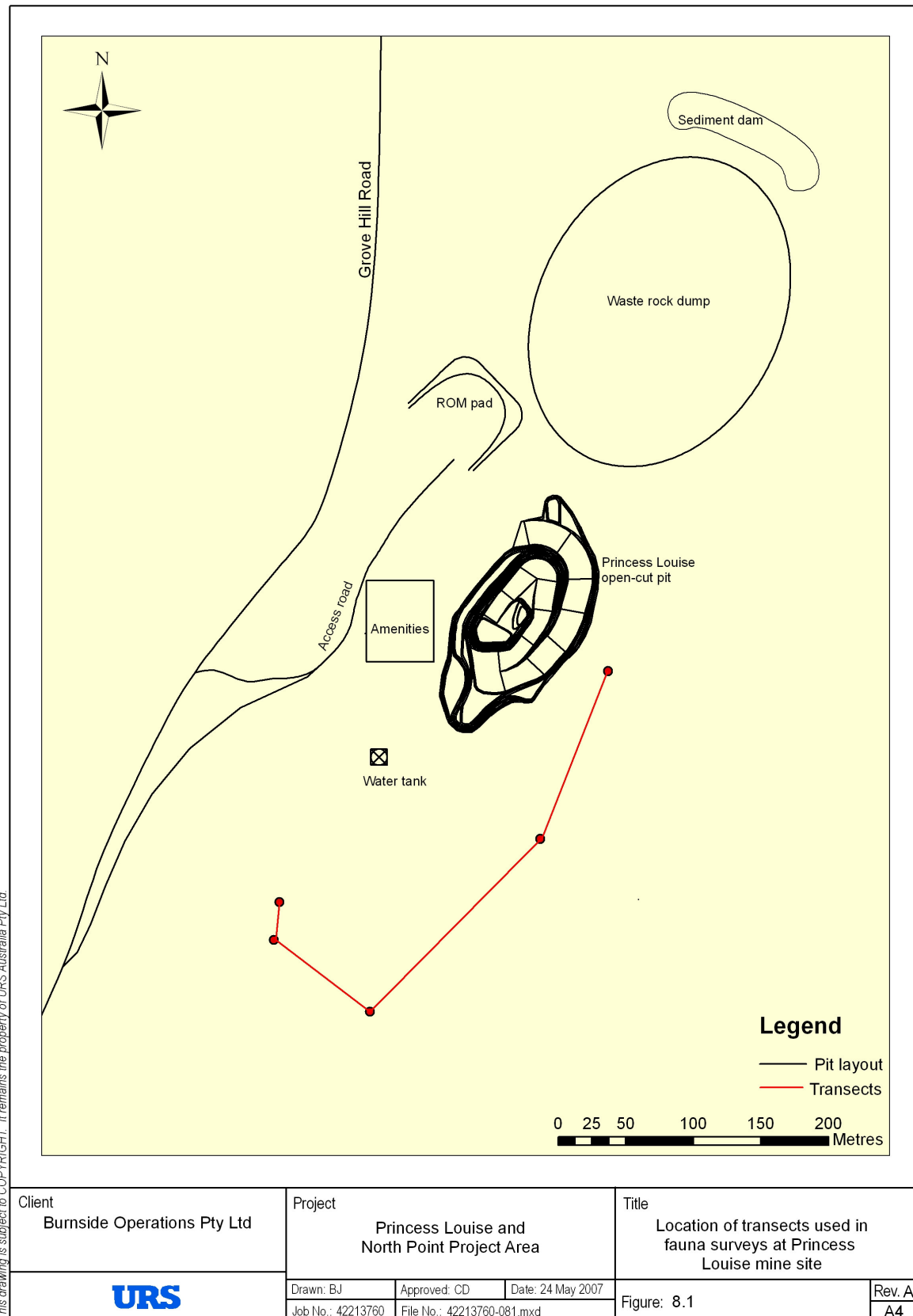
Species	Princess Louise	North Point	North Point Access	Princess Louise Access
<i>Myiagra rubecula</i> , leaden flycatcher	X		X	
<i>Pachycephala rufiventris</i> , rufous whistler	X	X	X	X
<i>Rhipidura leucophrys</i> , willie wagtail	X	X	X	
<i>Rhipidura rufiventris</i> , northern fantail	X			
<i>Grallina cyanoleuca</i> , magpie lark			X	X
<i>Chlamydera nuchalis</i> , great bowerbird	X	X	X	
<i>Coracina novaehollandiae</i> , black-faced cuckoo-shrike		X		
<i>Coracina papuensis</i> , white-bellied cuckoo-shrike	X	X	X	
<i>Lalage sueurii</i> , white-winged triller		X		
<i>Artamus cinereus</i> , black-faced woodswallow	X			
<i>Cracticus nigrogularis</i> , pied butcherbird	X			X
<i>Cracticus argenteus</i> , silver-backed butcherbird		X		
<i>Corvus orru</i> , toressian crow	X	X		
<i>Cisticola exilis</i> , golden-headed cisticola		X	X	X
<i>Taeniopygia bichenovii</i> , double-barred finch		X	X	
<i>Dicaeum hirundinaceum</i> , mistletoe bird	X	X	X	
Reptiles				
<i>Heteronotia binoei</i> , Bynoe's gecko	X	X		
<i>Lophognathus gilberti</i> , Gilbert's dragon	X			
<i>Diporiphora bilineata</i> , northern two-lined dragon	X	X	X	

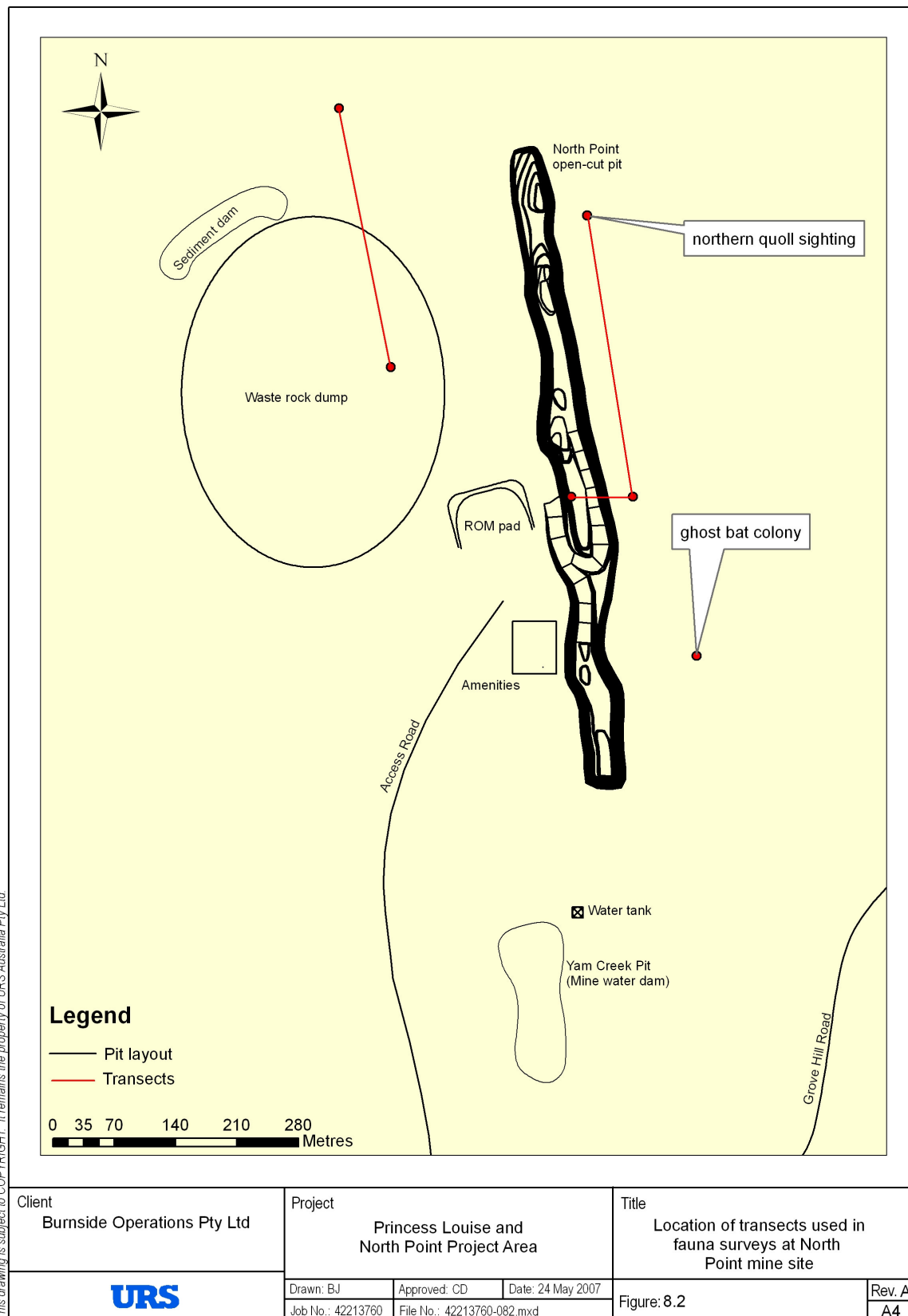


Species	Princess Louise	North Point	North Point Access	Princess Louise Access
<i>Cryptoblepharus sp.</i> , arboreal snake-eyed skink	X	X		
<i>Ctenotus robustus</i> , robust ctenotus	X	X		
<i>Morethia storri</i> , Storr's snake-eyed skink	X			
<i>Carlia amax</i> , striped rainbow skink	X	X		
<i>Carlia munda</i> , two-spined rainbow skink	X	X		
<i>Pseudechis australis</i> , king brown snake			X	
Amphibians				
<i>Uperolia sp.</i> toadlet		X		
<i>Litoria inermis</i> , Peter's frog	X	X		
<i>Litoria wotjulumensi</i> , wotjulum frog	X			
<i>Bufo marinus</i> , cane toad *	X			

* introduced species







8.1.2 Fauna habitats

As described in Section 7.1.2, eucalypt open forest with grass understorey is the dominant vegetation community throughout the project area.

There are also a number of old mine adits around the mine sites that could potentially provide habitat for bats. As mentioned in Section 8.1.1, a colony of ghost bats, *Macroderma gigas*, was sighted roosting in an adit adjacent to the North Point access road.

8.1.3 Significant fauna species

According to the Commonwealth legislation (*Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act), see site report in Appendix B), there are eleven bird species, two mammals, one shark and one reptile of conservation significance that could potentially occur in the vicinity of the project area (shown in Table 8.2).

One of these species, the northern quoll (Plate 8.1) was recorded at the North Point project site in May 2006 by Indicus. This species is currently listed as Endangered under the EPBC Act and as Vulnerable under the *Territory Parks and Wildlife Conservation Act* 1999 (NT) (TPWC Act). The northern quoll has been severely threatened by the spread of cane toads across the NT, as they eat the toads and die from poisoning (Woinarski 2003a).

BOPL has recognised the significance of this species and plans to commission a follow up survey and relocation program for any northern quolls in the mining area, before commencing operations at North Point. In consultation with Indicus and the Biodiversity Conservation Group at the Parks and Wildlife Commission NT, it has been determined that the best time of year to conduct this program is in the early dry season (around May), before the northern quoll's breeding season commences. A suitable relocation site has been identified at the Coomalie Farm, near Adelaide River, where existing conservation programs for the northern quoll are in progress in conjunction with Charles Darwin University.

It is noted that the TPWC Act database contains two records of sightings of the partridge pigeon in the vicinity of the project area (see Figure 8.3). Indicus did not record any partridge pigeons inside the project area, but did note one sighting incidentally, although the location was not recorded (see Appendix B). This species is listed as Vulnerable under the EPBC Act, and Near Threatened under the TPWC Act. Partridge pigeons are susceptible to changes in fire regimes (which impacts on the abundance and distribution of seeding grasses), predation by feral cats and drought conditions that affect local water supplies (Woinarski 2003b). A picture of the partridge pigeon is shown in Plate 8.2.

The locations of recorded sightings of threatened fauna in the vicinity of the project area are presented in Figure 8.3. The northern quoll sighting is based on Indicus' surveys, while the partridge pigeon data comes from NRETA records (NRETA 2006).

Of the other species listed in Table 8.2, the estuarine crocodile and freshwater sawfish are aquatic animals and are not likely to inhabit the project area, as the nearest suitable water body is the Margaret River, approximately 15 km from the mine site.



Table 8-2 Threatened fauna species listed for the project area under the EPBC Act and the TPWC Act

Scientific Name	Common Name	EPBC Act Status	TPWC Act Status	Survey results and comments
Birds				
<i>Erythrotriorchis radiatus</i>	Red goshawk	Vulnerable		Not identified in surveys, habitat widely distributed in the NT
<i>Erythrura gouldiae</i>	Gouldian finch	Endangered / Migratory		Not identified in surveys, habitat widely distributed in the NT
<i>Geophaps smithii smithii</i>	Partridge pigeon	Vulnerable	Near threatened	Incidentally identified adjacent to the survey area, habitat widely distributed in the NT
<i>Tyto novaehollandiae kimberli</i>	Masked owl	Vulnerable		Not identified in surveys, habitat widely distributed in the NT
<i>Coracina tenuirostris melvillensis</i>	Melville cicadabird	Migratory		Not identified in surveys
<i>Haliaeetus leucogaster</i>	White-bellied sea eagle	Migratory		Not identified in surveys
<i>Poecilodryas superciliosa cerviniventris</i>	Derby white-browed robin	Migratory		Not identified in surveys
<i>Rhipidura rufifrons</i>	Rufous fantail	Migratory		Not identified in surveys
<i>Charadrius veredus</i>	Oriental plover, oriental dotterel	Migratory		Not identified in surveys
<i>Glareola maldivarum</i>	Oriental pratincole	Migratory		Not identified in surveys
<i>Numenius minutus</i>	Little curlew, little whimbrel	Migratory		Not identified in surveys
Mammals				
<i>Dasyurus hallucatus</i>	Northern quoll	Endangered	Vulnerable	Identified in surveys, habitat widely distributed in the NT
<i>Saccolaimus saccolaimus nudicluniatus</i>	Bare-rumped sheath-tail bat	Critically endangered		Not identified in surveys or to occur in area of disturbance
Sharks				
<i>Pristis microdon</i>	Freshwater sawfish	Vulnerable		Not identified in surveys or to occur in area of disturbance
Reptiles				
<i>Crocodylus porosus</i>	Estuarine crocodile	Migratory		Not identified in surveys or to occur in area of disturbance

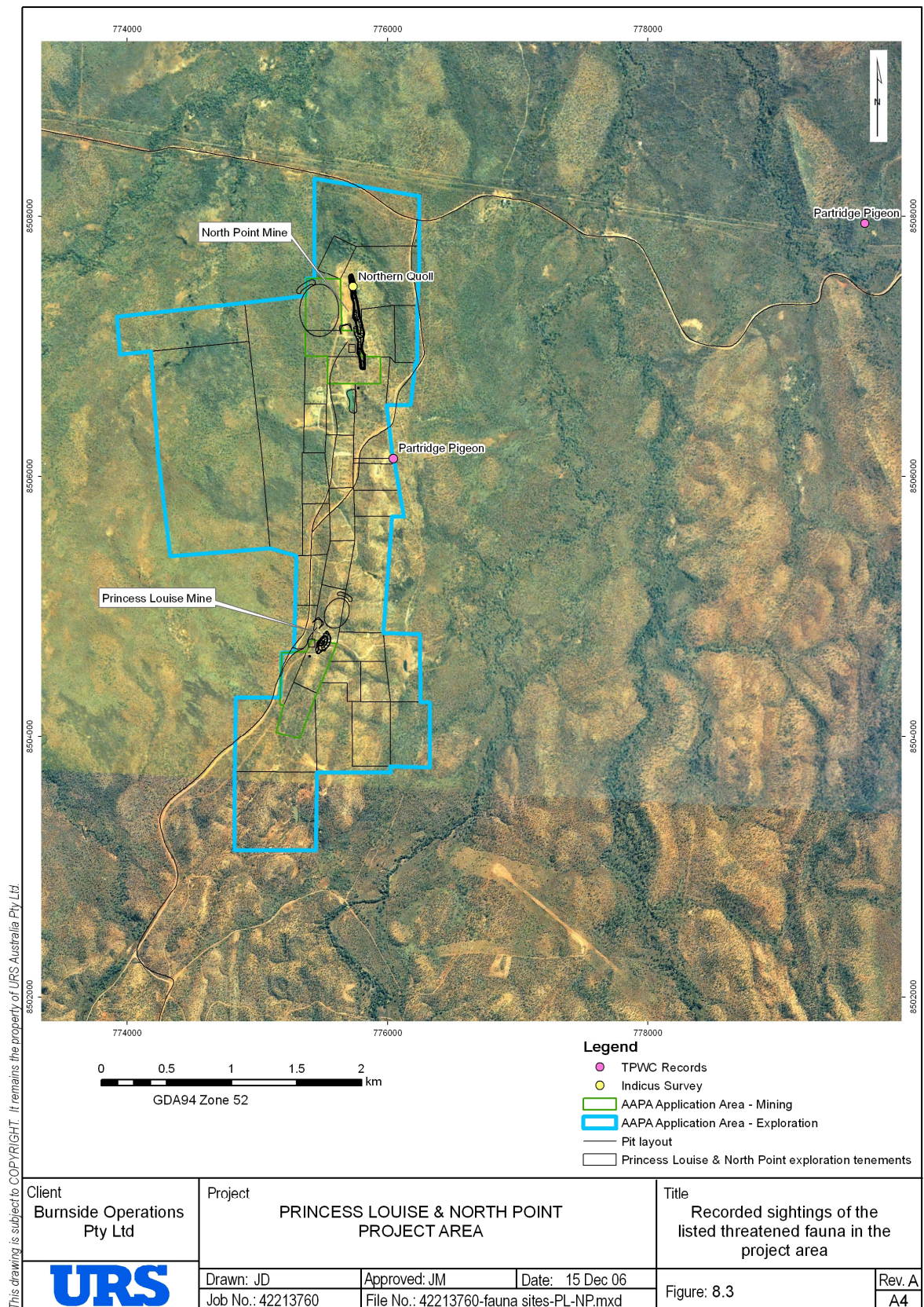




Plate 8-1 Northern quoll (*Dasyurus hallucatus*), (NT Wildlife Park)



Plate 8-2 Partridge pigeon (*Geophaps smithii smithii*); (Woinarski, 2003b)



The bare-rumped sheath-tail bat is a Critically Endangered species due to threats to its habitat in Queensland (Woinarski and Milner 2002). However, the species has only been recorded a small number of times in the NT, in the Kakadu lowlands, and there are no obvious threatening processes to the species in the NT. Therefore, the conservation status of the species is best described as Data Deficient (Woinarski and Milner 2002). As the bare-rumped sheath-tail bat was not recorded in the site field surveys, there is no reason to suspect that it is inhabiting the project area, or that it will be affected by mining activities.

Although it is not currently listed as a species of conservation significance under Commonwealth or Territory legislation, the ghost bat has undergone a major population range contraction in recent years; the reason for this decline is unclear (Worthington *et al* 1994).

The adit near North Point in which ghost bats were present is one of only a few in the area that has a lateral (as well as vertical) entrance at its base, providing approximately 10 m of underground overhang in which to roost (Indicus 2007). It is unclear, however, whether this is a requirement for ghost bat habitats, or whether they use multiple adits in the region.

8.2 Potential Impacts of Mining

Potential impacts to fauna from mining mainly involve loss of habitat via vegetation clearing for the mine pit, waste rock dump and infrastructure. Total areas to be cleared are comparatively small, however, comprising approximately 3.3 ha at the Princess Louise mine site and 12 ha for the North Point mine site (Table 7.2). There will be no tailings dam at either site, as mineral processing is to be undertaken at URGM. It is also noted that a significant proportion of both mine sites have been cleared by historic mining and recent exploration activities.

A large number of feral animals live in the Top End of the NT including wild pigs, horses, cats, donkeys, foxes and cane toads (NRETA 2006b). All these animals are hard to eradicate completely, and can out-compete or predate on native fauna, and damage native vegetation communities and soils. All these animals could potentially inhabit the project sites and surrounding areas but only two, cane toads and donkeys, were recorded in the field surveys of the sites.

Cane toads and donkeys were sighted regularly in the project area and could be impacting on the local flora and fauna (Indicus 2007). Feral donkeys cause erosion and damage vegetation with their hard hooves. They can also damage and foul waterholes, carry weed seeds, and out-compete native animals for food and water, especially during drought conditions (DEH 2004a). Cane toads are a well known threat to many native fauna species. The cane toad is poisonous to eat at every life stage from egg to adult, eats some native animals, and out-competes many others for food, habitat and breeding sites (DEH 2004b).

Feral species as well as opportunistic native animal populations could find food and water sources around the mine, and encouragement of the feral and opportunistic species could negatively impact upon native animals if not managed appropriately.

Fauna impacts may also result from changes to the water balance of the area, with regard to the availability of drinking water (surface water) and the potential impacts on the quality of surface water. It is proposed that the final pit voids be filled with water and made available as a source of water for



livestock and wildlife. Similarly, excess groundwater from pit dewatering at North Point is proposed to be stored in the existing Yam Creek mine pit, as a mine water dam, and will remain after mining as a water source for livestock.

The groundwater flowing into the pits and the existing Yam Creek pit is suitable for livestock (Chapter 6), however the quality of the water in pit voids and also the old Yam Creek pit will be assessed after mine closure (water monitoring programs are described in Section 18.1 and 18.2). Any water bodies that are unsuitable for drinking by animals will be fenced off.

Wildfires, should they occur, pose a threat to native fauna and have the potential to destroy habitat and limit food sources.

The North Point access road, which was originally proposed for alignment close to the ghost bat colony, has been moved to a different route and is now well away from the 50 m buffer area recommended for implementation by the fauna consultants (Indicus, 2007, see Appendix B for full report). This has greatly reduced the potential impact of noise and vibrations from haul trucks on the ghost bat roost.

8.3 Mitigation of Impacts

BOPL have developed a draft Fauna EMP, which is presented in Section 18.4. The key objectives of the Fauna EMP are to minimise impacts on local fauna and prevent the introduction and spread of feral and opportunistic native animals. The key inclusions in the draft Fauna EMP are:

- Minimise areas of disturbance, in particular areas where native trees and vegetation exist.
- Before the commencement of mining, conduct targeted surveys for northern quolls in the project area, and trap and relocate any quolls to a suitable site distant from the mining area, as described in the Endangered Species Management Program.
- Place the North Point access road at a distance of more than 50 m from the known ghost bat roost to minimise any impact from noise and vibration.
- Conduct a targeted follow-up survey for ghost bats in the project area during the dry season following commencement of mining, to assess impacts of the mining operation on the local population where possible.
- Carry out appropriate fire management, which ensures a spatial diversity of habitat structures, such as mosaic burning, which is already practiced by BOPL on all of their sites.
- Log all feral mammal sightings, and introduce feral animal control schemes if required.
- Log any mammal deaths and injuries that result from mining operations, and implement mitigation strategies if required (e.g. speed limits in particular zones).
- Assess the quality of the water in pit voids and the existing Yam Creek pit for their suitability as a water source for livestock and native animals after mine closure (water monitoring programs are



described in Section 18.1 and 18.2). Any water bodies that are unsuitable for drinking by animals will be fenced.

- Train key staff in identification of threatened species, wildlife rescue and relocation.
- Carry out appropriate waste management strategies as outlined in Section 14 and Section 18.10, to deter feral animals from entering the mine site to source food.

8.4 Commitments

BOPL commits to minimising areas of disturbance, in particular where native trees and vegetation exist.

BOPL commits to relocating any northern quolls if they are found, prior to mining.

During construction, BOPL commits to placing the North Point access road at a distance of more than 50 metres from the known ghost bat roost.

BOPL commits to conducting a targeted follow-up survey for ghost bats in the project area during the dry season following commencement of mining, to assess impacts of the mining operation on the local population where possible.

During operations, BOPL commits to implementing a Fire Management Plan that aims to provide a spatial diversity of habitat structures.

During operations, BOPL commits to implementing a procedure that required the logging of all feral mammal sightings, and managing feral animals as required.

BOPL commits to reporting any identified mammal deaths and injuries that result from mining operations and the implementation of mitigation strategies.

BOPL commits to assessing the quality of the water in pit voids and the existing Yam Creek pit for their suitability as a water source for livestock and native animals after mine closure, and fencing off any water bodies that are unsuitable for drinking by animals.

BOPL commits to appropriate waste management strategies that reduce the attraction of feral animals to the mine site.

