Appendix H

Environmental Impact Statement for Proposed Blacktip Terrestrial Fauna Study prepared by EcOz Environmental Services




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Environmental Impact Statement for the proposed Blacktip Project

Terrestrial Fauna Study

Prepared for: Woodside Energy Ltd.

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EXECUTIVE SUMMARY

This report documents baseline information on terrestrial vertebrate fauna for the Blacktip Project area, and assesses the potential impacts associated with the following onshore project activities:

- *construction and operation of the onshore processing plant.*
- *construction and operation of a buried onshore pipeline.*
- *construction and operation of associated roads and access routes (land only).*
- *construction camps and lay-down areas.*

Methodology
All known information sources were reviewed and relevant aspects documented to provide an historical background database. The area of study was assessed during several vegetation surveys during 2003 and 2004 (see EcOz Vegetation and Flora Study 2004, this volume), and a fauna habitat map was developed. Six sites were selected for the fauna surveys. Methodologies to survey the sites were development in consultation with NT Government authorities and followed the currently accepted practices for the region. The faunal sites were surveyed by trapping, observation and active searching for 3 days and nights by a team of two faunal experts.

Statutory obligations
Statutory obligations in relation to the protection of vegetation and flora apply to the project under the following NT and Commonwealth legislation:

- *Territory Parks and Wildlife Conservation Act 2000.*
- *Environment Protection and Biodiversity Conservation Act 1999.*

International Treaties and obligations apply to a number of faunal species. These are identified and addressed in the report.

Fauna habitats
Four fauna habitats were mapped in and immediately adjacent to the onshore project area based on amalgamation of vegetation communities interpreted from high resolution satellite imagery and field surveys. The habitats are:

- *eucalyptus forests to woodlands;*
- *sand dunes;*
- *monsoon vine forest; and*
- *mangroves.*

Only the Eucalyptus forest to woodlands and sand dune habitats are directly in the onshore development footprint as it stood at the time this report was prepared. Surveys were conducted in the eucalyptus forests and woodlands, and in the monsoon vine forests.

Faunal species
Sixty fauna species, including 2 frogs, 11 reptiles, 46 birds and one mammal species, were recorded during field surveys of the project area. The NT Fauna Atlas records for the project area documented 134 species within 20 km of the project area. The surveys added 28 species (2 frogs, 6 reptiles, 19 birds and one mammal) to the NT Fauna Atlas records.

Communities of conservation significance
Monsoon vine forest communities *occur at the northern and southern ends of Yelcher Beach where the pipeline shore crossing is located. The monsoon forests were surveyed for fauna because all monsoon vine forests are considered significant in a regional context due to their restricted size, and their high level of patch interdependence, although the project is unlikely to affect them.*

Species of conservation significance
None of the species recorded during surveys of the onshore project area are classified as 'threatened' under NT or Commonwealth legislation. Fourteen species of fauna classified as 'threatened' in the NT, including 4 bird species, 2 fishes, 1 mammal, 1 reptile and 6 marine turtles, are known to occur in the wider Darwin Coastal bioregion. The nationally 'threatened' mammal, the False Water Rat Xeromys myoides*, also occurs in the bioregion, but probably not in the project area. The conservation status and range of each of these species, and the likelihood of animals occurring in habitats in or near the project area are addressed in the report.*

Two of the listed 'threatened' species, the Red Goshawk Erythrotriorchis radiatus *and Brush-tailed Tree-rat* Conilurus penicillatus*, have a known range that extends to the onshore project area. These species were not recorded in the current field surveys and there are no previous records within a 20 km radius of the project area. This does not preclude their presence in the onshore project area where suitable tall forest habitats exist, however, it does indicate that:*

- *the presence of sensitive Red Goshawk nesting sites in the area is unlikely; and*
- *there is unlikely to be significant populations of the Brush-tailed Tree-rat present.*

A further 'threatened' fauna species, the Northern Brush-tailed Phascogale Phascogale tapoatafa pirata *has been identified as potentially occurring in the region. The Northern Brush-tailed Phascogale could potentially occur in the tall forest habitats in and surrounding the onshore project area, although the closest confirmed recent records are from Litchfield National Park some 160 km north-east of the project area. In the region where the project area is located, habitats of this species are extensive and largely unaffected by development.*

No migratory species have been recorded in the onshore project area in field surveys, but eight species have been identified as likely to occur. The species include the Saltwater Crocodile Crocodylus porosus*, three migratory wetland bird species, and four migratory terrestrial bird species. No waterbird roosting sites have been recorded in the onshore project area and the area is not considered to be significant for waterbirds.*

Eleven 'near-threatened' and regionally restricted species could potentially occur in the project area, although none were recorded in surveys. The known range of five terrestrial fauna species that are endemic to the Top End Coastal bioregion (combined Darwin Coastal and Arnhem Coast) extends to the project area, but none have been recorded for the area.

The monsoon rainforests north and south of the Yelcher Beach area at the pipeline landfall site have some conservation significance in a regional context. They are unlikely to be disturbed by the project. Seven species of bird which are typically associated with monsoon vine forests were recorded in the monsoon forests during the field surveys.

Potential Environmental Effects

The majority of the potential environmental effects on fauna associated with the Blacktip Project will be as a result of the disturbance and removal of native vegetation during the construction phase of the project. The main potential impacts of the project on fauna have been identified as:

- *short-term disturbance to the animals and habitats;*
- *habitat loss;*
- *impacts on species of conservation significance;*
- *fauna capture in open trench; and*
- *weeds and exotic species.*

There is significant scope for reducing the potential ecological impacts of the project by incorporating fauna considerations in the construction specifications. There are also opportunities to mitigate some of the potential adverse effects by implementing management actions before, during and after construction. Recommendations on management measures that should be implemented to minimise impacts on fauna are identified in this report. Additional measures for minimisation of site specific impacts should be developed following determination of the final design specifications.

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ACKNOWLEDGEMENTS

We would like to thank Alex Dudley and Ron Firth for undertaking the fauna surveys and the NT Museum and NT Herbarium for their assistance in identification of voucher specimens. The Department of Infrastructure, Planning and Environment is acknowledged for the provision of data to the project. Specifically, Peter Krause is acknowledged for collating the NT Fauna Atlas data for us.

1. INTRODUCTION

EcOz Environmental Services has been contracted by Woodside Energy Ltd. (WEL) to undertake studies of the terrestrial fauna at the project area proposed for the Blacktip Project. A detailed overview of the proposed project is provided in the referral documents submitted to the NT and Commonwealth Governments and in preliminary drafts of the EIS documents. These documents form the current design specifications on which the assessment of terrestrial fauna is based.

The proposed project has both onshore and offshore components. Assessment of the potential environmental impacts of the project will therefore consider interactions with both the marine and terrestrial environments in, and surrounding, the project area. This report is concerned with documenting baseline information on terrestrial fauna and assessing the potential impacts associated with the following onshore project activities:

- construction and operation of the onshore processing plant.
- construction and operation of a 3 km buried onshore pipeline.
- construction and operation of associated roads and access routes (land only).
- construction camps and laydown areas.

The last 2 points in the above list can only be partially assessed at this point in time as site selection and design specifications have not been finalised.

The marine environment in and surrounding the offshore project area is the subject of separate studies. For the purpose of this report, 'project area' refers to the onshore project area only.

The "Guidelines for Preparation of a Draft Environmental Impact Statement on the Proposed Blacktip Gas Project (Department of Infrastructure, Planning and Environment, March 2004)" detail the specific requirements of the EIS document that is to be prepared for the Blacktip Project in accordance with Clause 8 of the Environmental Assessment Administrative Procedures of the *Environmental Assessment Act (1982)* and Chapter 4 Division 6 of the *Environment Protection and Biodiversity Conservation Act (1999)*. The terrestrial fauna study was designed to satisfy the requirements of the Guidelines, and specifically to provide baseline information on which to base an assessment of potential impacts and development of appropriate mitigations measures for the project.

The aims of the fauna study are to:

- Undertake a desktop study to identify vertebrate fauna species and habitats that occur, or are likely to occur in areas that may be affected by the Project.

- Undertake a survey of key fauna habitats and areas likely to contain habitat for 'threatened' fauna species.

- Assess the conservation significance of fauna species and habitats that may be affected by the project in a local, regional and national context with specific reference to species listed under the provisions of the *Territory Parks and Wildlife Conservation Act 2000* and the *EPBC Act 1999*.

- Provide management recommendations and safeguards to minimise the impacts of the project on vertebrate fauna.

This report documents the findings of field surveys, consultations and reviews of existing information undertaken to assess the potential impacts of the Blacktip Project on terrestrial fauna.

2. METHODOLOGY

2.1. Desktop literature review

To identify the range of fauna species and habitats, and other environmental constraints that may occur in the project area, reviews of relevant literature and databases, and consultations with regional fauna experts from the NT Parks and Wildlife Commission were initially undertaken.

The main data sources utilised in the desktop review are listed below.

- NT Fauna Atlas records, provided by the Parks and Wildlife Commission, for the region (defined as within a 20 km radius of the onshore project area).
- EPBC Act Protected Matters Search Tool (search area defined as within a 10 km radius of the processing plant).
- Darwin Coastal Bioregion Summary (Woinarski 2002a).
- Recent data from surveys on seabirds (Chatto 2001), shorebirds (Chatto 2003) and waterbirds (Chatto 2000) in the region.
- Key scientific papers.

Fauna species and habitats of conservation significance identified from these data sources are discussed in section 5 of this report.

2.2. Fauna habitat map

A fauna habitat map was developed based on amalgamation of vegetation communities interpreted from high resolution satellite imagery. The habitat map was verified using vegetation survey data collected during 3 separate visits to the project area in May 2002, August 2003 and December 2003. The resultant map stratified the project area into four habitat types.

2.3. Field surveys

Field surveys of fauna were undertaken from the 1st to 5th of June 2004. A one day reconnaissance survey was undertaken to identify the most suitable survey sites for each habitat type based on representativeness, the presence of microhabitats and accessibility. Four survey sites were established at sites representative of the most dominant habitat types in the project area, eucalyptus open forest\woodland and coastal sand dunes. A further two sample sites were established in monsoon vine forest habitats near to the project area as they are considered as those most likely to support species of conservation significance. Table 1 summarises the locations of the fauna survey sites, which are shown in Figure 1.

Table 1 Fauna survey sites.

Fauna habitat	Site no.	Zone WGS 84	Easting	Northing
Eucalyptus woodland\forest	5A1	52	547034	8425889
Eucalyptus woodland\forest	5A2	52	545880	8426413
Monsoon vine forest	5B1	52	544477	8425760
Monsoon vine forest	5B2	52	544358	8425026
Eucalyptus woodland\forest	5C1	52	544699	8425747
Eucalyptus woodland\forest	5C2	52	545076	8426016

At each survey site the following environmental information was recorded:

- GPS coordinates;
- site photo;
- landscape position;
- soils and geology;
- presence\absence of water;
- evidence of fire, weeds and feral animals; and
- vegetation community structure and dominant species in each stratum.

The fauna surveys followed the widely accepted Bioregional Assessment Unit methods developed by the NT Parks and Wildlife Commission. At each survey site a 50 m x 50 m quadrat was established with each of 20 Elliott (box) traps, 4 cage traps and 4 pit traps. Each Elliot and cage trap was baited with a mixture of peanut butter and oats. All traps were opened for 3 consecutive nights and checked early each morning. The pitfall traps were left open for the entire trapping period with each trap being checked at least twice during the day to avoid animal deaths.

At each survey site, 3 diurnal and 2 nocturnal active searches, involving raking leaf litter, spot lighting and checking under bark and logs, were conducted. Eight diurnal 'instantaneous' bird counts were also conducted in each quadrat. Opportunistic observations were made along Yelcher Beach to identify any seabirds and shorebirds using the area. Opportunistic observations made whilst travelling around the project area between the survey sites were also recorded. Mangrove areas near the beach were surveyed for evidence of the False Water Rat *Xeromys myoides*. The False Water Rat lives on mud flats in mangrove habitat and evidence of its presence is given by distinctive holes in the mud, usually associated with fine remnants of crab shell, and in areas of high crab density (Woinarski *et al.* 2000; Woinarski pers. comm. 2004).

The surveys were conducted by a team of two experienced fauna surveyors with two local Aboriginal assistants from the nearby Wadeye community. Parks and Wildlife Commission Permit Number 17901 applied to the survey and appropriate Animal Ethics Clearance was obtained from Charles Darwin University Animal Ethics Committee.

Species were identified in the field by sight and expert identification, using a range of technical reference works, listed in the reference list. Animals that were unable to be identified in the field were taken as voucher specimens and lodged with the NT Museum for identification, where their identities were confirmed.

2.4. Evaluation of conservation significance

The conservation significance of fauna and habitats in and surrounding the project area was assessed with reference to the following:

- Threatened species listed under the *Territory Parks and Wildlife Conservation Act 2000* and\or *Environment Protection and Biodiversity Conservation Act 1999.*

'Threatened' species are those classified as extinct in the wild, critically endangered, endangered or vulnerable as assessed against IUCN categories. The *Territory Parks and Wildlife Conservation Act 2000* gives protected status to all species classified as 'threatened' in the NT and requires a person to apply for a permit to take or interfere with these species. Nationally 'threatened' species are a Matter of National Environmental Significance under the *Environment Protection and Biodiversity Conservation Act 1999*. In accordance with this Act, a person cannot take an action that will have a significant impact on a 'threatened' species without prior approval of the Commonwealth.

- Migratory species listed under the *Environment Protection and Biodiversity Conservation Act 1999.*

Listed migratory species include species listed in:

- to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals) for which Australia is a Range State under the Convention;
- the Agreement between the Government of Australia and the Government of the Peoples Republic of China for the Protection of Migratory Birds and their Environment (CAMBA); and
- the Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA).

Australia has an international obligation to protect species listed under these agreements. Migratory species as a Matter of National Environmental Significance under the *Environment Protection and Biodiversity Conservation Act 1999.*

- Species that are classified as Near-Threatened and\or have a regionally restricted distribution in the Northern Territory.

A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the future. Near Threatened species are not protected under legislation, however, the potential for these species to become more rare in the future has been identified and establishes a need to implement conservation measures to protect them.

Regionally restricted species for the purpose of this report are those that are endemic to the Top End Coastal Bioregion (Connors *et al*. 1996). This bioregion has recently been split into the Darwin Coastal and Arnhem Land bioregions by Environment Australia (2000), but is used here as endemic species lists have not been developed for the new bioregions.

The known range and habitat requirements of Near Threatened and regionally endemic species were identified with reference to Churchill (1998) for bats; Cole and Woinarski (2000) and Woinarski (2000) for mammals, Garnett and Crowley (2000) and Readers Digest (1997) for birds and Cogger (2000), Barker *et al.* (1995), and Wilson & Swan (2003) for amphibians reptiles. Identified species which appeared to occur outside their known ranges were referred to the NT Museum for verification that they were likely to occur in the location, or to verify that the record for the species was a new range extension.

- Habitats of listed 'threatened' species or habitats possessing outstanding biodiversity values.

Habitats of listed 'threatened' species or possessing outstanding biodiversity values are generally those identified from published literature, and from an assessment of habitat values in the project area.

3. RESULTS

3.1. Fauna habitats

Four fauna habitats were mapped in and immediately adjacent to the onshore project area based on amalgamation of vegetation communities interpreted from high resolution satellite imagery and field surveys. The habitats are:

- eucalyptus forests to woodlands;
- sand dunes;
- monsoon vine forest; and
- mangroves.

Only the Eucalyptus forest to woodlands and sand dune habitats are directly in the onshore development footprint as it stood at the time this report was prepared. Surveys were conducted in the eucalyptus forests and woodlands, and in the monsoon vine forests. Images of each of the six surveyed sites are provided in Appendix 1.

3.2. Fauna species

Sixty fauna species, including two frogs, 11 reptiles, 46 birds and one mammal species, were recorded during field surveys of the project area (Appendix 2).

The NT Fauna Atlas documented 134 species within 20 km of the project area. The surveys added 28 species (two frogs, six reptiles, 19 birds and one mammal) to the NT Fauna Atlas records. The species listed on the Atlas may or may not occur on the project area, depending on habitat availability, which is discussed to some extent in the following sections. A full list of species recorded in field surveys and from the desktop review is provided at Appendix 3.

3.2.1. Amphibians

Two frog species were recorded during the survey. Another seven were listed on the NT Fauna Atlas. The low numbers trapped and found during the survey probably reflect the habitats surveyed (woodland and closed and open forest), and the cooler weather. The frog species recorded in the NT Fauna Atlas records for the region are widespread and common species. During wetter times of year these species are likely to be encountered in limited numbers in the onshore project area. None of the frog species are of conservation significance. The Cane Toad appears to not have reached the Wadeye area at the time of the survey.

3.2.2. Reptiles

Eleven species of reptiles were recorded during the surveys, including two snakes, two geckoes, five skinks and two goannas. The two snakes, three of the skinks and one goanna were new records for the region, although were not range extensions. Most of the species identified in the NT Fauna Atlas are likely to occur in the vicinity of the project area, provided that suitable habitat is available. Some species, for instance Mitchell's Water Monitor, require fresh water for survival, so are not likely to occur near the project. Others are wide-spread and some are wide-ranging species which occur in a range of habitats, and could occur in the area from time to time. None of the species are listed as threatened.

A separate survey of marine turtles was undertaken for the project, and, therefore, this report will not discuss these species.

3.2.3. Birds

Forty six bird species were observed during the surveys, including 19 not previously recorded for the local area. None of the species recorded during the surveys are listed as being of conservation significance. Most of the common bird species recorded in previous regional records (Appendix 3) could be found in the area. A number of species which are listed as being of conservation significance (Appendix 3) could potentially be found in the project area. These are discussed below in section 4.

3.2.4. Mammals

The only mammals observed during the surveys were Agile Wallabies *Macropus agilis*. No mammals were trapped during the surveys. As the surveys were of short duration, this result is not unexpected, although it is usual to catch at least one or two mammals during surveys. The desktop studies suggested that a number of mammals could be expected to occur in the region, including some vulnerable species. These species are discussed below in section 4. Searches specifically for these species were conducted, and habitats suitable for the species were assessed and investigated. None were found in the onshore project area. This study was the first formal fauna study for the region, so there was no prior expectation that these vulnerable species would be present.

3.3. Introduced species

No introduced species were recorded in the project area during field surveys. Species that are likely to occur include the Feral Pig *Sus scrofa*. Signs of pigs were recorded in the area during previous investigations (Noel Preece, pers. comm. 2003), and they are likely to be present from time to time.

Feral animals, mainly pigs and buffalo, are identified as a key threatening process in the Darwin Coastal bioregion where the onshore development will be located. The monsoon rainforest patch network is being degraded by feral animals (principally pigs), the extensive eucalypt forests are broadly affected by feral animals and livestock, and the condition of riparian zones is generally declining because of damage associated with proliferation of feral pigs and buffalo, and (in some cases) unrestricted access by livestock (Woinarski 2002a). The effects of pigs and buffalo in the project area are minimal due to the lack of preferred wet habitats and the low numbers of animals likely to be present.

The Cane Toad *Bufo marinus* is an introduced species that now occupies much of Queensland, northern New South Wales and the Top End of the Northern Territory. Concern about the ecological impacts of Cane Toads is widespread and predation, competition and lethal toxic ingestion caused by Cane Toads is currently nominated for listing as a 'key threatening process' under the Commonwealth EPBC Act. Cane Toads are not yet present in the onshore project area, however, it is expected that they will naturally move into the area in the next few years. Their current range extends west of Katherine, and sightings have been reported in the Lower Daly River region (Frogwatch NT [Accessed 14 May 2004] http://www.frogwatch.org.au/canetoads/index.cfm). Movement of construction materials, vehicle and plant from infested areas to the onshore project area has potential to speed up the spread of Cane Toads, as does the creation of a cleared corridor for the onshore pipeline route.

4. CONSERVATION SIGNIFICANCE

There are a small number of regionally restricted and 'threatened' species that potentially occur in the project area as identified from the desktop review. Significant populations of these species are unlikely given their absence during the surveys, although their possible presence in the project area cannot be discounted. There are a number of fauna species, habitats and areas of conservation significance to fauna that occur in the wider region. These have been described in this section in recognition of the fact that project related activities, such as construction of access routes and sourcing of construction materials, will take place in the wider region, and potential project impacts are not restricted to the onshore project area.

4.1. Threatened species

None of the species recorded during surveys of the onshore project area are classified as 'threatened' under NT or Commonwealth legislation. Fourteen species of fauna classified as 'threatened' in the NT , including four bird species, two fishes, one mammal, one reptile and six marine turtles, are known to occur in the wider Darwin Coastal bioregion (Woinarski 2002a). The nationally 'threatened' mammal, the False Water Rat *Xeromys myoides,* also occurs in the bioregion. Table 2 documents the conservation status and range of each of these species, and the likelihood of animals occurring in habitats in or near the project area. The marine turtles are not covered here as they are outside of the scope of this study.

Two of the listed 'threatened' species included in Table 2, the Red Goshawk *Erythrotriorchis radiatus* and Brush-tailed Tree-rat *Conilurus penicillatus*, have a known range that extends to the onshore project area. These species were not recorded in the current field surveys and there are no previous records within a 20 km radius of the project area. This does not preclude their presence in the onshore project area where suitable tall forest habitats exist, however, it does indicate that:

- the presence of sensitive Red Goshawk nesting sites in the area is unlikely; and
- there is unlikely to be significant populations of the Brush-tailed Tree-rat present.

A further 'threatened' fauna species, the Northern Brush-tailed Phascogale *Phascogale tapoatafa pirata* has been identified by the NT Parks and Wildlife Commission (Woinarski and Fisher pers. comm. 2003) as potentially occurring in the region. The Northern Brush-Tailed Phascogale is a strongly arboreal dasyurid marsupial that typically inhabits open forest with sparse ground cover. The Northern Brush-tailed Phascogale could potentially occur in the tall forest habitats in and surrounding the onshore project area (Alaric Fisher pers. comm. 2004), although the closest confirmed recent records are from Litchfield National Park some 160 km north-east of the project area. Formerly, this species was widespread throughout the dry sclerophyll forest and woodlands of tropical and temperate Australia (Strahan 1995). Although much of its habitat has been reduced for agriculture on a national scale, the records of the tropical sub-species indicates that the range is widespread but sparse, making it vulnerable to localised extinction. In the region where the project area is located, habitats of this species are extensive and largely unaffected by development.

Table 2 Conservation status and distribution of 'threatened' species known to occur in the wider Darwin Coastal bioregion. Species lists are taken from Woinarski (2002) but have been updated to reflect recent changes to the conservation status of some species.

Species name	NT listing	EPBC listing	Distribution and likelihood of occurrence in the project area
Mammals			
Brush-tailed Tree-rat *Conilurus penicillatus*	VUL	-	The preferred habitat of the Brush-tailed Tree-rat *Conilurus penicillatus* is tall eucalypt forests with a shrubby understorey, although in some locations within its range it also occurs on coastal grasslands (Woinarski 2002c). The project area is well south of the known distribution of this species. Advice from the NT Bioregional Assessment Unit (Alaric Fisher pers. comm.) is that survey effort in the near-coastal tall open forest habitats in the west of the NT has been low and this species may occur in these habitats. On the basis of this advice, the possibility of this species occurring in the project area can not be discounted.
False Water Rat *Xeromys myoides*	NT	VUL	A poorly known native rodent, the False Water Rat *Xeromys myoides* is found to inhabit a variety of well-watered habitats from mangrove forests to sedged lakes (Strahan 1995). The species has previously been recorded in the Northern Territory from the South Alligator River, Daly River and most recently from the Glyde River in north-east Arnhem Land (Woinarski *et* al. 2000). The False Water Rat could potentially occur in the estuarine environments surrounding the project area (Woinarski pers. comm. 2004). Surveys in mangrove habitats on the headlands that flank the northern and southern end of Yelcher Beach near the project area, failed to find this species. This does not preclude its presence in the more well developed mangrove and saline grassland habitats that occur further to the north and south of the project area. In the event that *X. myoides* does occur in these habitats it is considered unlikely that they will be affected by the project which is at least 2 to 3 km away.
Birds			
Yellow chat *Epthianura crocea tunneyi*	EN	EN	The Yellow Chat is typically nomadic and inhabits the open, well-grassed swamplands of Northern Australia particularly those semi-arid regions that are prone to drying out where they frequent the edges of surface water bodies (Readers Digest 1997). The subspecies *Epthianura crocea tunneyi* is restricted to a small geographic area encompassing the floodplains from the Mary River to the East Alligator River (Schodde and Mason 1999), and within this area it is known from only about 12 sites (Woinarski 2002b). The known range of this species does not extend to the project area, and given the lack of suitable floodplain habitats in proximity to the project area it is considered unlikely that this species would occur there.
Red Goshawk *Erythrotriorchis radiatus*	VUL	VUL	The Red Goshawk occurs across much of northern Australia, from near Broome in the south-west Kimberley to south-eastern Queensland (Woinarski, 2001). This species lives in coastal and sub-coastal tall open forests and woodlands, tropical savannas traversed by wooded or forested rivers, and along the edges of rainforest (Marchant & Higgins 1993). The range of this species extends to the project area and there is potential for this species to occur in tall forest habitats in and surrounding the project area. Nest sites of this species are particularly vulnerable (Garnett and Cowley, 2000). No nest sites have been identified during field surveys of the project area.
Gouldian Finch *Erythrura gouldiae*	EN	VUL	Gouldian Finches occupy two different regions of the landscape on an annual cycle. In the dry season and part of the late wet season, between Feb and Oct, they live within wooded hills that contain a group of Eucalyptus species commonly referred to as "snappy gum" (*Eucalyptus tintinnans, E. brevifolia*). These species of trees provide nesting sites. During this period they feed upon native Sorghum and find water at small rocky waterholes that remain in the hills until next wet season. In the wet season Gouldian Finches move from the hills into the lowland drainage lines to feed upon perennial grasses that begin to seed mid Dec (Lewis, 2001). Gouldian Finches have not previously been recorded in proximity to the project area and the preferred habitats of this species do not occur there.
Partridge Pigeon *Geophaps smithii smithii*	VUL	VUL	The Partridge Pigeon (subspecies *Geophaps smithii smithii*) lives primarily in open forest and woodland dominated by Darwin Stringybark *Eucalyptus tetrodonta* and Darwin Woollybutt *E. miniata* that has a structurally diverse understorey (F. Fraser pers. comm.. cited in Garnett and Crowley 2000). The species is now recorded only in sub-coastal NT, principally from Kakadu and between Katherine and Darwin and the Tiwi Islands; also recorded near the McKinley, Daly and Finniss Rivers and west of Katherine (Garnett and Crowley 2000). The known range of this sub-species of the Partridge Pigeon does not extend as far west as the project area, and it was not recorded during field surveys of the project area.
Reptiles			

Species name	NT listing	EPBC listing	Distribution and likelihood of occurrence in the project area
Yellow-snouted Ground Gecko *Diplodactylus occultus*	VUL	-	The Yellow-snouted Ground Gecko *Diplodactylus occultus* is the only 'threatened' terrestrial reptile species known to occur in the Darwin Coastal bioregion. It is known from only a few localities, almost entirely from the northwest areas of Kakadu National Park and appears to occur in well-developed leaf litters and grasses in open Eucalyptus dominated forests (Beggs and Armstrong 2001). The known range of this species does not extend to the project area and it is considered highly unlikely that the species would occur there.
Fishes			
Speartooth Shark *Glyphis sp. A*	-	EN	In the Northern Territory, the Speartooth Shark is known only from the Adelaide-Alligator Rivers region (Stirrat and Larson, 2002). The known range of this species does not extend to the project area, and given that there are no permanent fresh water-bodies, it is considered that this species will not occur there.
Freshwater Sawfish *Pristis microdon*	VUL	DD	Freshwater Sawfish *Pristis microdon* is the largest fish found in Australia's fresh waters. Its range now appears to be extremely restricted, and it is now known only from a few northern Australian river systems. In the NT the species is known to occur in the Adelaide, Victoria and Daly Rivers (Pogonoski *et al.* 2002). Its know range does not include the project area and there are no permanent freshwater habitats nearby.

4.2. Migratory species

No migratory species (as defined by the *EPBC Act 1999*) have been recorded in the onshore project area in field surveys, but eight species have been identified as likely to occur. The species include the Saltwater Crocodile *Crocodylus porosus,* the migratory wetland bird species Oriental Pratincole *Glareola maldivarum,* Oriental Plover *Charadrius veredus,* Little Curlew *Numernius minutes*, and the migratory terrestrial bird species Melville Cicadabird *Coracina tenuirostris,* White-bellied Sea Eagle *Haliaeetus leucogaster,* Barn Swallow *Hirundo rustica,* Rufous Fantail *Rhiphidura rufifrons* (Appendix 3). A number of 'migratory' marine turtles and mammals may inhabit the surrounding marine environments. The potential occurrence of these species in the offshore project area is the subject of a separate report.

The Saltwater Crocodile *Crocodylus porosus* is unlikely to be present in the onshore project area due to the lack of permanent waterbodies. This species is likely to be present in the marine environments surrounding the project area and also in the coastal estuarine environments and larger freshwater rivers and creeks.

No waterbird roosting sites have been recorded in the onshore project area and the area is not considered to be significant for waterbirds (Chatto, pers. comm. 2004). There are some seabird breeding roosts (ie. Terns) recorded in proximity to the proposed pipeline landfall site, however, these are considered to have a low significance as groups typically consist of numbers in the low hundreds (Chatto pers. comm. 2004). The proposed onshore development is considered unlikely to cause significant impacts on these colonies (Chatto pers. comm. 2004) as suitable habitats are abundant in the region away from the project area. No shorebird roosts have been identified in the area.

4.3. Near-Threatened and regionally restricted species

Fifty-five terrestrial fauna species are classified as Near-Threatened in the Northern Territory. The known range of 20 of these species extends to the project area (Table 3). Of these species, 11 could potentially occur in habitats in the project area.

Table 3 Near-Threatened fauna species with a known range that extends to the project area.

Species	Range extends to project area	Suitable habitats may exist in or near project area
Mammals		
Northern Quoll *Dasyurus hallucatus*	YES	YES
Lesser Wart-nosed Horseshoe Bat *Hipposideros stenotis*	YES	YES
Ghost Bat *Macroderma gigas*	YES	NO
Black-footed Tree-rat *Mesembriomys gouldii*	YES	YES
Northern Nailtail Wallaby *Onychogalea unguifera*	YES	YES
Narbarlek *Petrogale concinna*	YES	NO
Western Chestnut Mouse *Pseudomys nanus nanus*	YES	NO
Pale Field-rat *Rattus tunneyi*	YES	NO
Orange Horseshoe Bat *Rhinonicteris aurantius*	YES	YES
False Water Rat *Xeromys myoides*	YES	YES
Birds		
Australian Bustard *Ardeotis australis*	YES	NO

Species	Range extends to project area	Suitable habitats may exist in or near project area
Bush Stone-curlew *Burhinus grallarius*	YES	YES
Emu *Dromaius novaehollandiae*	YES	YES
Yellow-rumped Mannikin *Lonchura flaviprymna*	YES	NO
Square-tailed Kite *Lophoictinia isura*	YES	YES
Grass Owl *Tyto capensis*	YES	NO
Masked Owl *Tyto navaehollandiae kimberli*	YES	YES
Clamorous Reed Warbler *Acrocephalus stentoreus*	YES	NO
Reptiles		
Chameleon Dragon *Chelosania brunnea*	YES	YES
Worrell's Turtle *Emydura subglobosa worrelli (listed as E. worrelli)*	YES	NO

The known range of five terrestrial fauna species that are endemic to the Top End Coastal bioregion (combined Darwin Coastal and Arnhem Coast) extends to the project area (Table 4). There are a number of endemic sea snakes and marine turtles that are not listed as they are outside of the scope of this study.

Table 4 Regionally endemic fauna species with a known range that extends to the project area.

Species	Range extends to project area	Suitable habitats may exist in or near project area
Mammals		
False Water Rat *Xeromys myoides*	YES	YES
Birds		
Chestnut Rail *Eulabeornis castaneoventris*	YES	NO
Barn Swallow *Hirundo rustica*	YES	YES
Asian Dowitcher *Limnodromus semipalmatus*	YES	NO
Reptiles		
Glaphyromorphous nigricaudis	YES	YES

Species that occur in eucalyptus open forest habitats, like those that dominate the project area, typically occupy extensive areas (Woinarski [Accessed 14 May 2004] http://savanna.ntu.edu.au/information/dk/dk_pa.html) as this vegetation community is widely distributed in the Top End. The habitats that dominate the onshore project area are well represented in the region. In this context the project area is considered to have low regional conservation significance for fauna.

4.4. Significant sites and habitats

Habitats with special biodiversity conservation values that occur in proximity to the project area include monsoon vine forest and coastal estuarine systems dominated by mangroves. There are no sites with special conservation significance to fauna that have been identified in proximity to the onshore project area. However, the wider Darwin Coastal bioregion does contain some ecologically significant sites worthy of mention. This section provides a brief description of the significance of the monsoon rainforest habitats that occur in proximity to the project area, and some sites with regional

and national conservation significance. The significance of the coastal estuarine systems in the region is being investigated as part of a separate study.

Dry monsoon rainforest habitats

The closest monsoon vine forest communities to the onshore project area occur at the northern and southern ends of the section of Yelcher Beach where the pipeline will come on-shore. The patch to the south is located 320 m from the seaward end of the export pipeline corridor and the patch to the north is located approximately 250 m from the seaward end of the export pipeline corridor. Monsoon vine forests are also likely to occur in association with the estuarine systems that occur along the coast to the north and south of the project area. Woinarski (http://savanna.ntu.edu.au/information/dk/dk_pa.html) considers monsoon rainforests to be a highly significant environment for wildlife in the region, supporting a distinctive fauna. Fauna species typically associated with monsoon rainforests (Bach *et al.* 1999; Price *et al.* 1998; Woinarski 1993) that were recorded during field surveys near the project area include:

Emerald Dove[2]	*Chalcophaps indica*
Rose-crowned Fruit-Dove[1] [2] [3]	*Ptilinopus regina*
Varied Triller[2]	*Lalage leucomela*
Little Shrike-thrush[2]	*Colluricincla megarhyncha*
Yellow Oriole[1] [2] [3]	*Oriolus flavocinctus*
Green-backed Gerygone[2]	*Gerygone chloronota*
Spangled Drongo[2]	*Dicrurus bracteatus*

Bach *et al.* 1999[1]; Woinarski 1993[2]; Price *et al.* 1999[3]

Especially in the wet season, the rainforests provide concentrations of fruit far greater than those across the rest of the landscape, and these attract flying-foxes and fruit-eating pigeons, orioles, cuckoos and figbirds. Many of these animals move between rainforest patches and the surrounding open forest, and the conservation of this rainforest environment is probably dependent upon the maintenance of as many patches as possible and extensive areas of their surrounding habitats (Price *et al.* 1999; Woinarski http://savanna.ntu.edu.au/information/dk/dk_pa.html).

Waterbird habitats

The sub-coastal wetlands of the monsoonal wet-dry tropics of the Top End are recognised for their high conservation value (Whitehead & Chatto 1996). The Darwin Coastal bioregion contains all or part of several nationally important wetland systems (Woinarski 2002a). The nearest 'important wetland' to the project area is the Moyle Floodplain and Hyland Bay system, which is located 50 km to the east. These floodplains are most notable for their waterbird fauna and are considered to be one of the most important areas for colonial breeding waterbirds in the NT (Chatto 2000).

5. POTENTIAL ENVIRONMENTAL EFFECTS AND MANAGEMENT RECOMMENDATIONS

The potential effects of the Blacktip Project on fauna have been minimised as much as possible during the design phase by locating major project infrastructure to avoid impacts on key fauna habitat areas such as monsoon rainforests, mangroves, wetlands, and rivers and creeks. The majority of the potential environmental effects on fauna associated with the project will be associated with the short-term disturbance of animals and habitats during the construction phase. The main potential longer-term impacts of the project on fauna have been identified as:

1. habitat loss;
2. impacts on species of conservation significance;
3. fauna capture in open trench; and
4. weeds and exotic species.

Other potential impacts, such as those associated with changes to hydrology, water quality, effluent and waste management, hazardous substances and increased risk of fire, are considered to have a lower potential impact on fauna, and therefore are not discussed in detail in this report. Impacts associated with the onshore gas flare will be mainly on shorebirds, seabirds and marine turtles, which are being considered in a separate study.

There is significant scope for reducing the potential ecological impacts of the project by incorporating fauna considerations in the construction specifications. There are also opportunities to mitigate some of the potential adverse effects by implementing management actions before, during and after construction. Recommendations on management measures that should be implemented to minimise impacts on fauna are identified in this section. Additional measures for minimisation of site specific impacts should be developed following determination of the final design specifications.

5.1. Short-term loss of species from area

5.1.1. Potential Effects

Short-term disturbance and possible loss of species in and adjacent to the project area during the construction phase is likely to represent the major environmental effect of the project on terrestrial fauna. The project area is located in a substantially natural and remote area, which is generally visited only by local Aboriginal people, and where there is no industrial development for hundreds of kilometres. The increased activity in the area during the construction phase will represent a substantial deviation from the ambient environmental conditions. Construction activities will involve a large number of personnel, vehicles and plant moving around the project area, and along access tracks that presently receive very little traffic. This will result in increased noise levels, creation of dust and generally high levels of disturbance for the period in which construction will take place.

The disturbance caused by construction activities will likely be sufficient to cause some fauna to avoid using the surrounding areas for the duration of construction and possibly longer. High levels of vehicle traffic during the construction phase will likely result in increased numbers of road casualties. During the operational phase when activity levels in the area decrease, fauna may move back into the areas adjacent to the project area. Overall, it is considered that long-term impacts on fauna will be negligible due to the widespread availability of similar habitats in the surrounding areas.

5.1.2. Management

The following recommendations should be considered to minimise the loss of fauna from the area:

1. Develop a noise reduction strategy for the construction and operational phases of the project.

2. Implement dust minimisation strategies.

3. Restrict vehicle travel on access routes to daylight hours, avoiding dusk and dawn in particular and between sunset and sunrise where possible to minimise fauna casualties.

5.2. Habitat loss and reduced connectivity

5.2.1. Potential Effects

Construction in areas of intact native vegetation may cause a decline in the physical condition of fauna habitats both directly through removal or disturbance of vegetation, and indirectly through general changes to environmental conditions that extend beyond the actual zone of disturbance. Construction of the shore crossing (working width currently 60 m) and onshore pipeline (2.2 km x 40 m) will be via an 'open cut' technique, which will result in the clearing of sand dune and eucalyptus woodland habitats. A further 56 ha of eucalyptus woodland to forest habitat will be cleared for the gas plant, and associated lay-down and camp areas. In the context of the large areal extent of eucalyptus woodland habitats in the region, it is considered that the extent of clearing associated with the project is unlikely to have a significant long-term impact on habitat availability for fauna.

Additional clearing of habitats will be associated with the:

- construction of an access route from Wadeye to the onshore plant site;
- sourcing of construction materials; and
- potentially the construction of a beach barge landing and heavy vehicle access road from the beach landing to the plant site.

The details of these aspects of the project are yet to be finalised and therefore the habitat types and extents that will be affected by the project cannot be determined. However, it can be established at this stage that there is potential for adverse effects on sensitive fauna habitats, especially riparian zones, as a result of these activities.

Construction of the onshore pipeline, gas plant and access roads will result in changed environmental conditions at the edges of the cleared areas (edge effects) (Ford *et al.* 2001; Hobbs, 2001) and may create a barrier to the movement of some fauna species. Barriers can act as impediments to animal movement between habitat patches (Kozakiewicz 1993), or can affect animal movement by creating more complex movement paths as individuals approach a barrier, withdraw, and approach again (McDonald and St Clair 2003). The magnitude of barrier effects will depend on species behaviour and mobility (Goosem *et al*. 2001). Species of fauna that are habitat specialists or that move amongst several habitats are particularly at risk (Ford *et al*. 2001; Harrington *et al*. 2001). A study into the effects of habitat fragmentation on selected species of mammals, birds and reptiles in the NT, found that certain species were excluded from areas where less than a 30% of bush remained within a 4 km radius (Parks and Wildlife Commission of the Northern Territory 2001). Whilst most species of fauna at the project area will move across areas cleared of vegetation in the onshore project area, some species will not, or will reduce their level of movement.

5.2.2. Management

The following management measures should be considered to minimise the effects of habitat loss and fragmentation associated with the project:

4. Keep the extent of the working footprint for all project components, including access tracks and borrow pits, to the minimum area necessary for construction activities. This is particularly important at the shore crossing and at riparian areas where habitats are particularly sensitive to disturbance.

5. Consult with Traditional Owners and other Aboriginal representative groups, to develop appropriate mitigation strategies.

6. Avoid clearing of large mature fruiting trees (such as *Ficus virens*, *Terminalia microcarpa*, *Syzygium nervosum* and *Canarium australianum*), which provide important habitat and act as a stepping stone between fragmented habitats.

7. Clearly mark the work area using construction pegs, construction flagging, or other temporary measures, and identify areas requiring special protection as 'no-go' areas on construction plans and on the ground.

8. Undertake construction in the vicinity of watercourses as early as possible in the dry season and ensure that appropriate rehabilitation or erosion control structures are in place prior to the first wet season rains.

9. Stage clearing of vegetation in accordance with the construction schedule to minimise the time between clearing and rehabilitation.

10. Design additional project infrastructure, including access routes, vehicle and plant storage and turn-around areas, borrow pits etc. so that:

    a. previously disturbed areas are used where possible;

    b. areas of sensitive vegetation are avoided; and

    c. low impact construction techniques are used in environmentally sensitive areas.

11. Develop a rehabilitation plan prior to construction. Include a rehabilitation schedule, proposed techniques, species proposed for use, and the following general principles:

    a. Stockpile top soil and suitable vegetative matter near to the area from which it was taken so that it can be respread over the area during rehabilitation.

    b. Locate stockpiles within the marked working width.

    c. Store excavated soil on-site in an area previously cleared of vegetation, or remove to an appropriate area off-site. Any on-site or off-site location needs to be approved by DIPE prior to dumping.

    d. Clearly mark appropriate locations for dumping of spoil.

12. Brief all construction staff on the importance of protecting fauna species and habitats.

5.3. Impacts on species of conservation significance

5.3.1. Potential Effects

Two listed 'threatened' species, the Red Goshawk *Erythrotriorchis radiatus* and Brush-tailed Tree-rat *Conilurus penicillatus*, have a known range that extends to the onshore project area. The tall forest habitats typically utilised by the Red Goshawk and Brush-tailed Tree-rat are found in and around the project area, however, these species were not recorded during field surveys and there are no previous records within a 20 km radius of the project area. A further two 'threatened' mammals, the Brush-tailed Phascogale *Phascogale tapoatafa* (in suitable tall forest) and False Water Rat *Xeromys myoides* (in suitable mangrove habitats) may occur in the project area, although this would represent a substantial expansion to their known ranges.

Nesting sites of the Red Goshawk *Erythrotriorchis radiatus* are highly susceptible to disturbance and the bird's tolerance to habitat fragmentation is yet to be determined (Garnett and Crowley 2000). If a nest site was to occur in proximity to locations where construction activities were taking place this could result in failure of the nest. Surveys of the onshore project area did not identify any nest sites of

this species. Given that nests are large and are typically located in tall trees, it is considered highly likely that any nest sites that did occur in the project area would have been identified during the field surveys.

There is unlikely to be significant populations of the Brush-tailed Tree-rat or Brush-tailed Phascogale in proximity to the project area. The tall forest habitats that are typically the habitat of the Brush-tailed Tree-rat and Brush-tailed Phascogale, are well represented in coastal NT and in areas adjacent to the project area. Given that high quality habitats for these species are widely available in the region, it is considered unlikely that the project will cause long-term impacts to any populations.

There is unlikely to be significant populations of the False Water Rat *Xeromys myoides* in close proximity to the project area. The more extensive mangrove and saline grassland habitats that occur in association with Injin Beach (north of the project area) and Yelcher Beach (south of the project area) are considered more likely to provide suitable habitat. In the event that *Xeromys myoides* does occur in these habitats it is considered unlikely that they will be affected by the project, which is at least 2 to 3 km away.

The project area does not occur in close proximity to any significant shorebird or waterbird colonies (Chatto 2003, 2000). Seabird breeding roosts (ie. Terns) have been recorded in proximity to the proposed pipeline landfall site, although these are considered to have a low significance (Chatto 2001). The proposed onshore development is considered unlikely to cause significant impacts on shorebirds or waterbirds in the region (Chatto, pers. comm. 2004).

5.3.2. Management

The following management recommendations should be considered, in addition to measures1-11, to minimise the potential impacts of the project on fauna species of conservation significance:

12. Contractors to report all large bird nesting sites (e.g. large single nests like those typically built by Red Goshawks and Sea Eagles, or nesting colonies) so that they can be assessed prior to disturbance.

13. Assess the conservation significance to fauna, i.e. near riparian areas, prior to siting of additional project infrastructure.

5.4. Fauna capture in open trench

5.4.1. Effect

Construction of the shore crossing and onshore pipeline has the potential to cause fauna mortality due to capture in the open trench during construction. Animals that are captured in trenches are exposed to various elements such as stress, predators, effects from the sun and subsequent dehydration (Woinarski *et al.,* 2000). The pipeline route has been designed to avoid areas of high faunal conservation value such as monsoon vine forests, wetlands and riparian areas, a strategy recommended by Woinarski *et al*. (2000). Whilst this design measure will hopefully minimise the number of animals that become trapped in the open trench, a large number of animals will still get trapped, and will die unless appropriate measures are in place to facilitate their escape or removal

5.4.2. Management

Investigations of wildlife mortality in a pipeline trench in the NT (Woinarski *et al.* 2000) resulted in a series of recommendations to reduce capture and mortality during trench construction (Table 5). The procedures recommended by Woinarski *et al.* (2000) should be considered as a way to minimise fauna mortality associated with the project.

Table 5 Recommendations to reduce capture and mortality of fauna in pipeline trench.

Type of measure	Recommended procedure	Explanation
Construction operational	14. Undertake operations in the most benign season (i.e. in the second and third quarters).	Wildlife mortality is likely to be highest in hot (or very cold) weather; Wildlife activity may also be higher in warm weather than cool weather, so capture rates would be greater
Construction operational	15. Interrupt trench with frequent "escape ramps" for captured wildlife	Exit points from the trench will enable trapped animals to leave the trench: sloping ramps away from the trench every 200-500m should be sufficient for most species
Construction operational	16. Minimise the time the trench is opened, through careful planning of construction and pipe laying	Fewest animals will be trapped if pipe laying (and immediately thereafter trench filling) occurs within 24 hrs of trench opening
Construction operational	17. Site pipeline route to avoid areas of exceptional conservation values (eg. remnant bushland, essential habitat for threatened species, etc.)	These areas are likely to contain species of high conservation value, so they should be avoided.
Inspection	18. Ensure that trenches are inspected frequently (by a wildlife handler)	Animals captured in the trench should be removed, identified and released in a vegetated area near to where it was captured. Trench inspections and collection and removal of species must be undertaken by an experienced wildlife handler to facilitate accurate identification and minimise stress to the animal. The data obtained from these collections will form a valuable information source, and may be a condition of approval by the NT Govt.

Source: Adapted from Woinarski *et al.* (2000).

5.5. Introduction and spread of weeds and exotic fauna species

5.5.1. Effect

Activities associated with the construction and operation stages have a high potential to introduce weeds and feral animals into remote areas that are currently relatively unaffected by exotic species. The greatest risk of weeds and feral animals being introduced and spread will occur during the construction phase of the project when plant and equipment sourced from elsewhere in the region and Australia may act as vectors of exotic species introduction to the project area. Road access routes to the project area from Darwin and Katherine traverse areas where infestations of declared weed species are present, and where the Cane Toad *Bufo marinus* is currently found. The construction and maintenance of a right of way (ROW) cleared of tall vegetation may also facilitate movement of feral grazing animals (i.e. cattle, donkey, buffalo), and the dispersal of Cane Toads.

If exotic species become established in the project area they will compete with native species of flora and fauna. In the case of the grassy weed species, especially Gamba Grass *Andropogon gayanus* and Mission Grasses *Pennisetum polystachion* and *P. pedicellatum* which are present along access routes to the project area, they can also create conditions for hot, intense fires that adversely impact on native vegetation and fauna. Cane Toads may cause a decline in numbers of some native fauna species that eat the Toad, or through competition for resources.

5.5.2. Management

The following management measures are recommended to minimise the introduction and spread of exotic plants and animals during project construction and operation:

19. Identify and treat existing weed infestations at the project area, along access routes and at borrow pits prior to construction activities.

20. Consult with the Department of Infrastructure, Planning and Environment - Weeds Branch to develop an exotic species management programme for construction and operation, incorporating the following elements:

    a. Inspections of vehicles, plant and equipment for Cane Toads prior to crossing the Daly River;
    b. wash-down and inspection of vehicles, plant and equipment prior to moving off main roads to remove weed propagules;
    c. Inspection of construction materials sourced outside the project lease area;
    d. Requirements for providers of construction materials to certify their 'weed free' status;
    e. Weed and exotic fauna awareness training and inductions, including Cane Toad recognition;
    f. A weed monitoring and treatment programme that commences immediately following construction and continues throughout the operation stage of the project;
    g. A Cane Toad reporting strategy.

21. Only use species native to the area in rehabilitation and landscaping.

22. Determine species suitability for use in consultation with experts in rehabilitation techniques in tropical environments.

23. Prohibit taking of domestic animals to the project area.

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Appendix 1

Figures

Site 5A1 Eucalyptus woodland/forest

Site 5A2 Eucalyptus woodland/forest

Site 5B1 Monsoon vine forest north

Site 5B2 Monsoon vine forest south

Site 5C1 Eucalyptus Woodland

Site 5C2 Eucalyptus Woodland

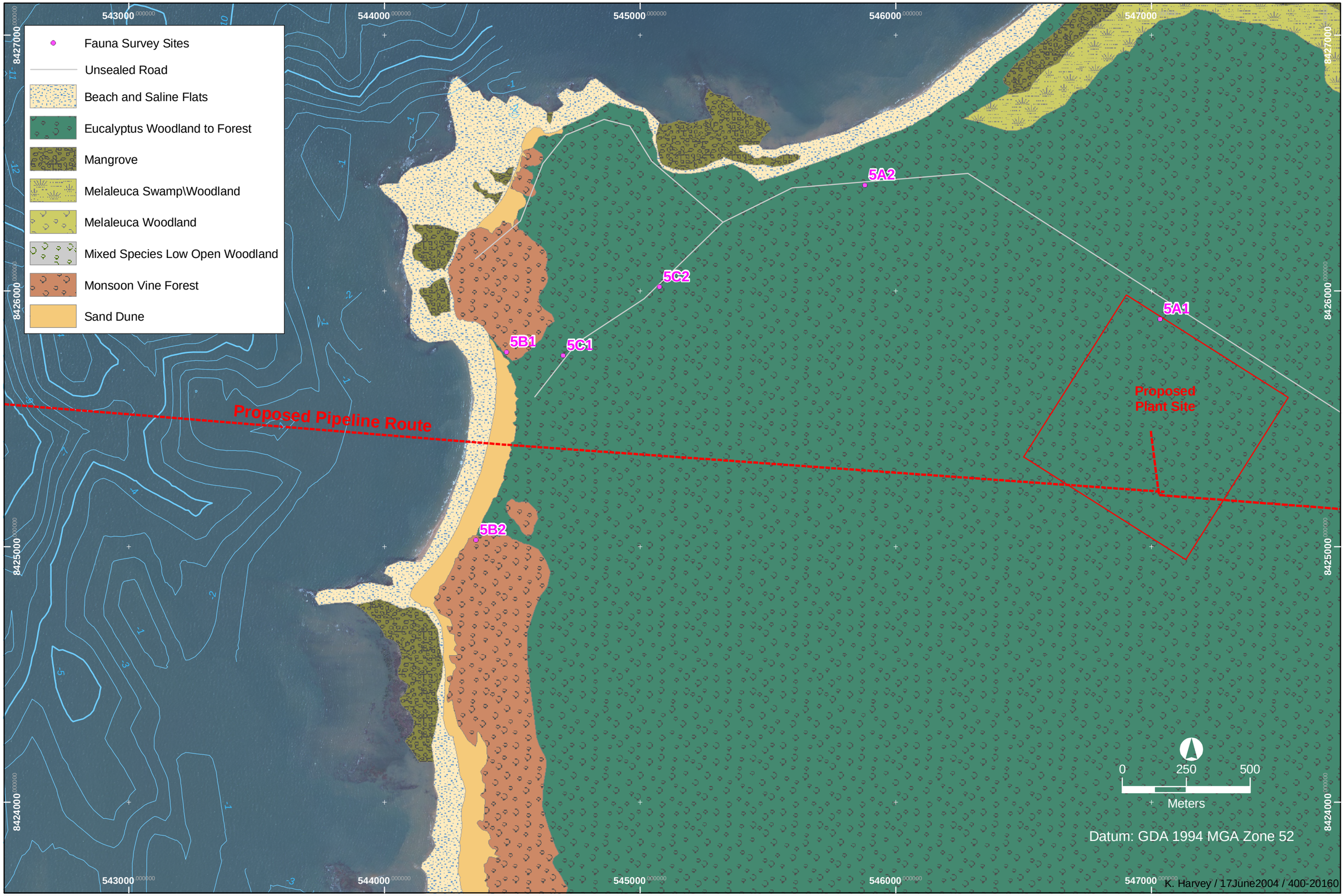

FIGURE 1: FAUNA HABITATS AND SURVEY SITES

WOODSIDE AUSTRALIAN ENERGY

Appendix 2

Results of fauna survey undertaken 2nd to 6th June 2004

Family	Common name	Scientific name	5A1	5A2	5B1	5B2	5C1	5C2
			Total	Total	Total	Total	Total	Total
Frogs								
MYOBATRACHIDAE	Marbled Frog	*Limnodynastes convexiusculus*		1				
MYOBATRACHIDAE	Ornate burrowing frog	*Limnodynastes ornatus*			9			1
Reptiles								
BOIDAE	Children's Python	*Antaresia childreni*		1				
COLUBRIDAE	Common Tree Snake	*Dendrelaphis punctulata*					1	
GEKKONIDAE	Gecko	*Gehyra australis*	1	1	1	1	2	3
GEKKONIDAE	Bynoe's gecko	*Heteronotia binoei*	2	5			1	2
SCINCIDAE	Skink	*Carlia munda*	4	5	5		16	7
SCINCIDAE	Skink	*Cryptoblepharus plagiocephalus*		2	1		5	2
SCINCIDAE	Skink	*Ctenotus essingtonii*	1		3		1	3
SCINCIDAE	Skink	*Menetia alanae*	3					
SCINCIDAE	Skink	*Morethia storri*						2
VARANIDAE	Spotted Tree Monitor	*Varanus scalaris*		1				
VARANIDAE	Yellow-spotted Monitor	*Varanus panoptes*			1			
Birds								
ACCIPITRIDAE	Brahminy Kite	*Haliastur indus*			1	1		
ACCIPITRIDAE	Whistling Kite	*Haliastur sphenurus*		1				
ACCIPITRIDAE	Osprey	*Pandion haliaetus*		1				
AEGOTHELIDAE	Australian Owlet-nightjar	*Aegotheles cristatus*	1					
ARTAMIDAE	Pied Butcherbird	*Cracticus nigrogularis*	5	1			2	4
ARTAMIDAE	White-breasted Woodswallow	*Artamus leucorhynchus*						2
CACATUIDAE	Red-tailed Black-cockatoo	*Calyptorhynchus banksii*		1			3	1
CACATUIDAE	Sulphur-crested Cockatoo	*Cacatua galerita*	1				1	1
CAMPEPHAGIDAE	Varied Triller	*Lalage leucomela*			1	4		
CAMPEPHAGIDAE	White-bellied Cuckoo-shrike	*Coracina papuensis*	3				1	2
CAMPEPHAGIDAE	White-winged Triller	*Lalage sueurii*			1			
CENTROPODIDAE	Pheasant Coucal	*Centropus phasianinus*					1	
COLUMBIDAE	Bar-shouldered Dove	*Geopelia humeralis*	1		2	6	4	6
COLUMBIDAE	Emerald Dove	*Chalcophaps indica*				1		
COLUMBIDAE	Rose-crowned Fruit-Dove	*Ptilinopus regina*				3		
CORVIDAE	Torresian Crow	*Corvus orru*		2			1	1
DICAEIDAE	Mistletoebird	*Dicaeum hirundinaceum*	2	1				2
DICRURIDAE	Leaden Flycatcher	*Myiagra rubecula*	1				1	
DICRURIDAE	Magpie-lark	*Grallina cyanoleuca*		2			3	
DICRURIDAE	Spangled Drongo	*Dicrurus bracteatus*	2		1	1	3	2
DICRURIDAE	Willie Wagtail	*Rhipidura leucophrys*						1
FALCONIDAE	Australian Hobby	*Falco longipennis*						1
HALCYONIDAE	Blue-winged Kookaburra	*Dacelo leachii*	1	1	3	1	2	
MELIPHAGIDAE	Bar-breasted Honeyeater	*Ramsayornis fasciatus*		2				
MELIPHAGIDAE	Blue-faced Honeyeater	*Entomyzon cyanotis*	1					
MELIPHAGIDAE	Brown Honeyeater	*Lichmera indistincta*	2	1			1	2

Family	Common name	Scientific name	5A1	5A2	5B1	5B2	5C1	5C2
			Total	Total	Total	Total	Total	Total
MELIPHAGIDAE	Helmeted Friarbird	*Philemon buceroides*		1		2		
MELIPHAGIDAE	Little Friarbird	*Philemon citreogularis*			1			
MELIPHAGIDAE	Silver-crowned Friarbird	*Philemon argenticeps*	3	4	1		3	3
MELIPHAGIDAE	White-throated Honeyeater	*Melithreptus albogularis*	4	4			5	5
MEROPIDAE	Rainbow Bee-eater	*Merops ornatus*	1	2			1	2
ORIOLIDAE	Olive-backed Oriole	*Oriolus sagittatus*			1	3		
ORIOLIDAE	Yellow Oriole	*Oriolus flavocinctus*				1		
PACHYCEPHALIDAE	Little Shrike-thrush	*Colluricincla megarhyncha*				1		
PACHYCEPHALIDAE	Rufous Whistler	*Pachycephala rufiventris*	2	1				
PARDALOTIDAE	Green-backed Gerygone	*Gerygone chloronota*			1	3		
PARDALOTIDAE	Striated Pardalote	*Pardalotus striatus*	6	3			4	4
PARDALOTIDAE	Weebill	*Smicrornis brevirostris*	2					
PODARGIDAE	Tawny Frogmouth	*Podargus strigoides*	1	1				
POMATOSTOMIDAE	Grey-crowned Babbler	*Pomatostomus temporalis*	1				6	1
PSITTACIDAE	Northern Rosella	*Platycercus venustus*	2				1	
PSITTACIDAE	Rainbow Lorikeet	*Trichoglossus haematodus*	7	1		2		
PSITTACIDAE	Red-winged Parrot	*Aprosmictus erythropterus*	2		1			
PTILONORHYNCHIDAE	Great Bowerbird	*Chlamydera nuchalis*			1			
STRIGIDAE	Barking Owl	*Ninox connivens*	1					
STRIGIDAE	Southern Boobook	*Ninox novaeseelandiae*	1					
Mammals								
MACROPODIDAE	Agile wallaby	*Macropus agilis*			3	2	2	4

Floral species on survey sites

Family name	Species name	Common name	5A1	5A2	5B1	5B2	5C1	5C2
Dominant								
ACANTHACEAE	*Hypoestes floribunda*				G			
ANACARDIACEAE	*Buchanania obovata*	Green Plum	M	M/G			G	
ARECACEAE	*Livistona humilis*	Sand Palm	M				M	M
BOMBACACEAE	*Bombax ceiba*					G		
CAESALPINIACEAE	*Erythrophleum chlorostachys*	Ironwood	G				U/G	U/G
CAESALPINIACEAE	*Tamarindus indicus*	Tamarind			U	U		
COMBRETACEAE	*Terminalia ferdinandiana*	Billy-goat Plum	M	M	M		M	M/G
CYCADACEAE	*Cycas maconochiei*		M	M			M	M
EUPHORBIACEAE	*Petalostigma pubescens*	Quinine Tree	M					
LECYTHIDACEAE	*Planchonia careya*	Cocky Apple	M	M/G			M/G	G
LOGANIACEAE	*Strychnos lucida*	Strychnine Tree			M	M		
MALVACEAE	*Hibiscus tiliaceus*				M			
MIMOSACEAE	*Acacia difficilis*				M			
MIMOSACEAE	*Acacia dimidiata*		M					
MORACEAE	*Ficus aculeata*	Sandpaper Fig					M	
MYRTACEAE	*Corymbia confertiflora*	Broad-leaved Carbeen			M		M	M
MYRTACEAE	*Corymbia porrecta*	Grey Bloodwood	U/M	U			U	
MYRTACEAE	*Eucalyptus miniata*	Darwin Woollybutt	U	U			U	U
MYRTACEAE	*Eucalyptus spp (seedlings)*		G	G			G	G
MYRTACEAE	*Eucalyptus tetrodonta*	Darwin Stringybark	U	U			U	U
OPILIACEAE	*Opilia amentacea*							G
POACEAE	*Cymbopogon bombycinus*				G			
POACEAE	*Cymbopogon sp.*							G
POACEAE	*Eragrostis cumingii*				G			
POACEAE	*Eriachne triseta*				G			
POACEAE	*Heteropogon triticeus*		G	G			G	G
POACEAE	*Sarga sp.*		G	G			G	G
POACEAE	*Setaria apiculata*		G				G	G
POACEAE	*Themeda triandra*	Kangaroo Grass						
PROTEACEAE	*Grevillea decurrens*		M	M			M	
PROTEACEAE	*Grevillea goodii*		M					
PROTEACEAE	*Persoonia falcata*		G					M
RHAMNACEAE	*Alphitonia excelsa*	Milkwood						G
RUBIACEAE	*Spermacoce sp.*							G
SANTALACEAE	*Exocarpos latifolius*				M	M		
STERCULIACEAE	*Brachychiton diversifolius*	Kurrajong		M		M	G	M/G
STERCULIACEAE	*Brachychiton megaphyllus*	Large-leaved Kurrajong						G
STERCULIACEAE	*Brachychiton paradoxus*	Red-flowered Kurrajong					G	G
VERBENACEAE	*Vitex glabrata*						M	
Other sub-dominant species								
ACANTHACEAE	*Dicliptera ciliata*						G	
AMARANTHACEAE	*Gomphrena sp.*				G			
ANACARDIACEAE	*Buchanania obovata*	Green Plum						M
ANNONACEAE	*Polyalthia nitidissina*					M		
APOCYNACEAE	*Alstonia spectabilis*					M		
APOCYNACEAE	*Wrightia pubescens*				M			
ARECACEAE	*Livistona humilis*	Sand Palm		M				
ASTERACEAE	*Blumea saxatilis*						G	
BURSERACEAE	*Canarium australianum*	Melville Is White Beech					M	
CAPPARACEAE	*Capparis umbonata*	Wild Orange		M				M

Family name	Species name	Common name	5A1	5A2	5B1	5B2	5C1	5C2
CELASTRACEAE	*Denhamia obscura*						M	M
COMBRETACEAE	*Terminalia canescens*	Winged Nut Tree		U				
COMBRETACEAE	*Terminalia pterocarya*			U				
CONVOLVULACEAE	*Jacquemontia paniculata*				G			
DILLENIACEAE	*Hibbertia muelleri*		G					
DILLENIACEAE	*Pachynema sphenandrum*			M				
EUPHORBIACEAE	*Drypetes deplanchei*				M	M		
EUPHORBIACEAE	*Mallotus nesophilus*				M			
FABACEAE	*Abrus precatorius*	Crab-eye Vine			G			
FABACEAE	*Desmodium pullenii*			G				
FABACEAE	*Flemingia sp.*							G
FABACEAE	*Indigofera saxicola*		G					
FABACEAE	*Milletia pinnata*				M			
FABACEAE	*Plagiocarpus axillaris*		5A1					
FLAGELLARIACEAE	*Flagellaria indica*					M		
GOODENIACEAE	*Goodenia sp.*						G	
LAMIACEAE	*Anisomeles malabarica*						M	
LAURACEAE	*Litsea glutinosa*				M			
LAURACEAE	*Neolitsea brassii*					M		
LILIACEAE	*Protasparagus racemosa*	Asparagus Fern			M			
LORANTHACEAE	*Amyema sanguinea var. pulchra*	Mistletoe		U/M				
MIMOSACEAE	*Acacia lamprocarpa*			M				M
MIMOSACEAE	*Acacia sp.*			M				
MORACEAE	*Ficus aculeata*	Sandpaper Fig						M
MYRISTICACEAE	*Myristica insipida*					M		
OLEACEAE	*Jasminum molle*	Native Jasmine			M			
OPILIACEAE	*Cansjera leptostachya*					M		
OPILIACEAE	*Opilia amentacea*					M		
ORCHIDACEAE	*Dendrobium affine*	Orchid					U	U
PANDANACEAE	*Pandanus spiralis*	Screw Palm						G
PLUMBAGINACEAE	*Plumbago zeylanica*					M		
POACEAE	*Cymbopogon sp.*							G
POACEAE	*Panicum sp.*						G	
POACEAE	*Sarga plumosum*	Perennial sorghum					M	
POACEAE	*Sarga timorense*	Annual sorghum	G					
POACEAE	*Themeda triandra*	Kangaroo Grass					M	
RUBIACEAE	*Gardenia megasperma*	Gardenia		M			M	M
RUBIACEAE	*Ixora timorensis*					M		
RUBIACEAE	*Timonius timon*					M		
RUTACEAE	*Glycosmis trifoliata*					M		
RUTACEAE	*Micromelum minutum*					M		
SAPINDACEAE	*Distichostemon hispidulus*		M					
SCROPHULARIACEAE	*Buchnera linearis*		G	G				
STERCULIACEAE	*Waltheria indica*		G					
TILIACEAE	*Grewia breviflora*				M	M		
TILIACEAE	*Grewia oxyphylla*				M			
TILIACEAE	*Grewia retusifolia*							M
TILIACEAE	*Triumfetta sp.*				M			
ULMACEAE	*Celtis philippensis*					G		
VERBENACEAE	*Premna acuminata*				M			
VERBENACEAE	*Vitex glabrata*						M	
VITACEAE	*Cissus reniformis*						M	
XANTHORRHOEACEAE	*Lomandra tropica*		G					

U = Upper storey M = Middle storey G = ground and climbing & scrambling species

Appendix 3

List of vertebrate fauna species recorded from the project area and region

Species	Conservation status		Data source			
	NT	Comm	Field surveys	NT Fauna Atlas	EPBC Act Report	Other
AMPHIBIANS						
Bilingual Froglet *Crinia bilingua*				✓		
Marbled Frog *Limnodynastes convexiusculus*			✓			
Ornate burrowing frog *Limnodynastes ornatus*			✓			
Northern Dwarf Tree-frog *Litoria bicolor*				✓		
Copland's Rock Frog *Litoria coplandi*				✓		
Rockhole Frog *Litoria meiriana*				✓		
Rocket Frog *Litoria nasuta*				✓		
Pale Frog *Litoria pallida*				✓		
Roth's Tree-frog *Litoria rothii*				✓		
Uperoleia sp. (inornatus?)			✓			
REPTILES						
Family Agamidae						
Two-lined Dragon *Diporiphora bilineata*				✓		
Northern Water Dragon *Lophognathus temporalis*				✓		
Family Boidae						
Children's Python *Antaresia childreni*			✓			
Family Colubridae						
Common Tree Snake *Dendrelaphis punctulata*			✓			
White-Bellied Mangrove Snake *Fordonia leucobalia*				✓		
Slaty-Grey Snake *Stegonotus cucullatus*				✓		
Keelback *Tropidonophis mairii*				✓		
Family Crocodylidae						
Saltwater Crocodile *Crocodylus porosus*		Migratory			✓	
Family Elapidae						

Species	Conservation status		Data source			
	NT	Comm	Field surveys	NT Fauna Atlas	EPBC Act Report	Other
Olive Whip Snake *Demansia olivacea*				✓		
Orange-naped snake *Furina ornata*				✓		
Family Gekkonidae						
Diplodactylus immaculatus				✓		
HouseGecko *Gehyra australis*			✓	✓		
Bynoe's Gecko *Heteronotia binoei*			✓	✓		
Family Pygopodidae						
Burton's Legless Lizard *Lialis burtonis*				✓		
Family Scincidae						
Slender Rainbow Skink *Carlia gracilis*				✓		
Robust Rainbow Skink *C. longipes*				✓		
Skink *Carlia munda*			✓			
Three-spined Rainbow Skink *C. triacantha*				✓		
Arboreal Snake-eyed Skink *Cryptoblepharus plagiocephalus*			✓	✓		
Northern Ctenotus *Ctenotus borealis*				✓		
Skink *Ctenotus essingtonii*			✓			
Douglas' Skink *Glaphyromorphus douglasi*				✓		
Dark-tailed Skink *G. nigricaudis*				✓		
Skink *Menetia alanae*			✓			
Storr's Snake-Eyed Skink *Morethia storri*			✓	✓		
Family Varanidae						
Sand Goanna *Varanus gouldii*				✓		
Mitchell's Water Monitor *V. mitchelli*				✓		
Yellow-spotted Monitor *Varanus panoptes*			✓			
Spotted Tree Monitor *V. scalaris*			✓	✓		
Black-headed Monitor *V. tristis*				✓		
BIRDS						
Family Anatidae						

Species	Conservation status		Data source			
	NT	Comm	Field surveys	NT Fauna Atlas	EPBC Act Report	Other
Grey Teal *Anas gracilis*				✓		
Family Accipitridae						
Letter Winged Kite *Elanus scriptus*				✓		
Red Goshawk *Erythrotriorchis radiatus*	Vulnerable	Vulnerable			✓	
Brahminy Kite *Haliastur indus*			✓			
Whistling Kite *Haliastur sphenurus*			✓	✓		
White-bellied Sea-Eagle *Haliaeetus leucogaster*		Migratory			✓	
Osprey *Pandion haliaetus*			✓			
Black Kite *Milvus migrans*				✓		
Family Ardeidae						
Great Egret *Ardea alba*						Chatto (2000)
Little Egret *A. garzetta*						Chatto (2000)
Cattle Egret *A. ibis*						Chatto (2000)
Pied Heron *A. picata*						Chatto (2000)
Nankeen Night Heron *Nycticorax caledonicus*						Chatto (2000)
Family Artamidae						
Black-faced Woodswallow *Artamus cinereus*				✓		
White Breasted Woodswallow *A. leucorynchus*				✓		
Little Woodswallow *A. minor*				✓		
Pied Butcher-bird Cracticus nigrogularis			✓			
Family Burhinidae						
Beach Thick-knee *Esacus magnirostris*						Chatto (2000)
Family Cacatuidae						
Sulphur-crested Cockatoo *Cacatua galerita*			✓	✓		
Galah *Eolophus roseicapilla*				✓		
Red-tailed Black Cockatoo *Calyptorhynchus banksii*			✓	✓		
Family Campephagidae						
Melville Cicadabird *Coracina tenuirostris melvillensis*		Migratory			✓	

Species	Conservation status		Data source			
	NT	Comm	Field surveys	NT Fauna Atlas	EPBC Act Report	Other
Black-faced Cuckoo-shrike *C. novaehollandiae*				✓		
White-bellied Cuckoo-shrike *C. papuensis*			✓	✓		
White-winged Triller *Lalage sueurii*			✓			
Varied Triller *Lalage leucomela*			✓	✓		
Family Campephagidae						
Pheasant Coucal *Centropus phasianinus*			✓			
Family Charadriidae						
Greater Sand Plover *Charadrius leschenaultii*						Chatto (2003)
Lesser Sand Plover *C. mongolus*						Chatto (2003)
Red-capped Plover *C. ruficapillus*						Chatto (2003)
Oriental Plover *C. veredus*		Migratory			✓	Chatto (2003)
Grey Plover *Pluvialis squatarola*						Chatto (2003)
Masked Lapwing *Vanellus miles miles*				✓		
Family Columbidae						
Emerald Dove *Chalcophaps indica*			✓	✓		
Bar-shouldered Dove *Geopelia humeralis*			✓	✓		
Peaceful Dove *G. striata*				✓		
Rose-crowned Fruit-Dove *Ptilinopus regina*			✓			
Family Corvidae						
Torresian Crow *Corvus orru*			✓	✓		
Family Cracticidae						
Pied Butcherbird *Cracticus nigogularis*				✓		
Family Cuculidae						
Common Koel *Eudynamys scolopacea*				✓		
Family Dicaeidae						
Mistletoebird *Dicaeum hirundinaceum*			✓	✓		
Family Dicruridae						
Spangled Drongo *Dicrurus bracteatus*			✓	✓		

Species	Conservation status		Data source			
	NT	Comm	Field surveys	NT Fauna Atlas	EPBC Act Report	Other
Leaden Flycatcher *Myiagra rubecula*			✓			
Magpie-lark *Grallina cyanoleuca*			✓			
Willie Wagtail *Rhipidura leucophrys*			✓			
Family Epthianuridae						
Yellow Chat *Epthianura crocea tunneyi*	Endangered					
Family Falconidae						
Nankeen Kestrel *Falco cenchroides*				✓		
Australian Hobby Falco longipennis			✓			
Family Glareolidae						
Oriental Pratincole *Glareola maldivarum*		Migratory			✓	
Family Grallinidae						
Magpie lark *Grallina cyanoleuca*				✓		
Family Gruidae						
Brolga *Grus rubicunda*				✓		
Family Haematopodidae						
Pied Oystercatcher *Haematopus longirostris*						Chatto (2000)
Family Halcyonidae						
Blue-winged Kookaburra *Dacelo leachii*			✓	✓		
Collared Kingfisher *Todiramphus chloris*				✓		
Red-backed Kingfisher *T. pyrrhopygia*				✓		
Family Hirundinidae						
Tree Martin *Hirundo nigricans*				✓		
Barn Swallow *H. rustica*		Migratory			✓	
Family Laridae						
Little Tern *Sterna albifrons*						Chatto (2001)
Family Meliphagidae						
Rufous-banded Honeyeater *Conopophila albogularis*				✓		
Rufous-throated Honeyeater *Conopophila rufogularis*				✓		

Species	Conservation status		Data source			
	NT	Comm	Field surveys	NT Fauna Atlas	EPBC Act Report	Other
Blue-Faced Honeyeater *Entomyzon cyanotis*			✓	✓		
White-gaped Honeyeater *Lichenostomus unicolor*				✓		
Brown Honeyeater *Lichmera indistineta*			✓	✓		
White-throated Honeyeater *Melithreptus albogularis*			✓	✓		
Red-headed Honeyeater *Myzomela erythrocephala*				✓		
Dusky Honeyeater *M. obscura*				✓		
Silver-crowned Friarbird *Philemon argenticeps*				✓		
Helmeted Friarbird *Philemon buceroides*			✓			
Little Friarbird *P. citreogularis*				✓		
Bar-breasted Honeyeater *Ramsayornis fasciatus*			✓			
Family Meropidae						
Rainbow bee-eater *Merops ornatus*			✓	✓		
Family Muscicapidae						
Lemon Bellied Flycatcher *Microeca flavigaster*				✓		
Shining Flycatcher *Myiagra alecto*				✓		
Rufous Fantail *Rhipidura rufifrons*		Migratory			✓	
Northern Fantail *R. rufiventris*				✓		
Family Oriolidae						
Yellow Oriole *Oriolus flavocinctus*			✓	✓		
Olive-backed Oriole *Oriolus sagittatus*			✓			
Family Pachycephalidae						
Little Shrike-thrush *Colluricincla megarhyncha*			✓			
Rufous Whistler *Pachycephala rufiventris*			✓	✓		
Grey Whistler *P. simplex*				✓		
Family Pardalotidae						
Striated Pardalote *Pardalotus striatus*			✓	✓		
Weebill *Smicrornis brevirostris*			✓	✓		
Green-backed Gerygone *Gerygone chloronota*			✓	✓		

Species	Conservation status		Data source			
	NT	Comm	Field surveys	NT Fauna Atlas	EPBC Act Report	Other
Mangrove Gerygone *G. levigaster*				✓		
Large Billed Gerygone *G. magnirostris*				✓		
Family Phalacrocoraxidae						
Little Pied Cormorant *Phalacrocorax melanoleucos*				✓		Chatto (2000)
Little Black Cormorant *P. sulcirostris*				✓		Chatto (2000)
Family Podargidae						
Tawny Frogmouth *Podargus strigoides*			✓			
Family Pomatostomidae						
Grey-crowned Babbler *Pomatostomus temporalis*			✓			
Family Psittacidae						
Red-winged Parrot *Aprosmictus erythropterus*			✓			
Northern Rosella *Platycercus venustus*			✓			
Varied Lorikeet *Psitteuteles versicolor*						
Rainbow Lorikeet *Trichoglossus haematodus*			✓	✓		
Family Ptilonorhynchidae						
Great Bowerbird *Chlamydera nuchalis*			✓	✓		
Family Scolopacidae						
Common Sandpiper *Actitis hypoleucos*				✓		
Ruddy Turnstone *Arenaria interpres*						Chatto (2003)
Sharp-tailed Sandpiper *Calidris acuminata*						Chatto (2003)
Sanderling *C. alba*						Chatto (2003)
Red Knot *C. canutus*						Chatto (2003)
Great Knot *C. tenuirostris*						Chatto (2003)
Red-necked Stint *C. ruficollis*						Chatto (2003)
Bar-tailed godwit *Limosa lapponica*						Chatto (2003)
Black-tailed godwit *L. limosa*						Chatto (2003)
Little Curlew *Numenius minutus*		Migratory			✓	
Whimbrel *N. phaeopus*				✓		Chatto (2003)

Species	Conservation status		Data source			
	NT	Comm	Field surveys	NT Fauna Atlas	EPBC Act Report	Other
Eastern Curlew *N. madagascariensis*						Chatto (2003)
Grey-tailed tattler *Tringa brevipes*						Chatto (2003)
Common Greenshank *T. nebularia*				✓		Chatto (2003)
Marsh Sandpiper *T. stagnatilis*						Chatto (2003)
Terek Sandpiper *Xenus cinereus*						Chatto (2003)
Family Strigidae						
Barking Owl *Ninox connivens*			✓			
Southern Boobook *Ninox novaeseelandiae*			✓	✓		
Family Sylviidae						
Goldern Headed Cisticola *Cisticola exilis*				✓		
Family Threskiornithidae						
Royal Spoonbill *Platalea regia*						Chatto (2000)
Australian White Ibis *Threskiomis molucca*				✓		Chatto (2000)
Straw-necked Ibis *T. spinicollis*				✓		
Family Zosteropidae						
Yellow White-eye *Zosterops luteus*				✓		
MAMMALS						
Family Macropodidae						
Agile wallaby *Macropus agilis*			✓			
Family Muridae						
Brush-tailed Tree-Rat *Conilurus penicillatus*	Vulnerable			✓		Parks and Wildlife Commission pers. comm
Delicate Mouse *Pseudomys delicatulus*				✓		
False Water Rat *Xeromys myoides*	Near Threatened	Vulnerable			✓	
Family Phalangeridae						
Northern Brushtail Possum *Trichosurus vulpecula arnhemensis*				✓		
Family Pteropodiae						
Black Flying Fox *Pteropus alecto*				✓		

Species	Conservation status		Data source			
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FISHES						
Freshwater Sawfish *Pristis microdon*	VUL	DD			✓	