Fauna Assessment of Cockatoo Island (Desktop Review)

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Cover Photo: Little Corella supplied by Cockatoo Mining Joint Venture.

Executive Summary

Cockatoo Island is located in the Buccaneer Archipelago, approximately 135 km north of Derby in the Kimberley region of Western Australia. In August 2000, Cliffs Natural Resources (Cliffs) and Henry Walker Eltin (HWE) combined to form the Cockatoo Mining Pty Ltd Joint Venture. High grade ore is currently being extracted from below sea level through the "Embankment project". However, mining is expected to cease on the island in 2012 and progressive closure planning of the minesite operations is underway.

Part of the progressive mine closure planing will involve development of suitable rehabilitation criteria incorporating flora species of local provenance. To date, some rehabilitation of previously disturbed sites has taken place, with varying degrees of success. In an effort to understand the ecological assemblages of the Island, both flora (desktop and site survey) and fauna desktop review and site reconnaissance have been commissioned. This report details the finding of a desktop vertebrate fauna review and site reconnaissance conducted in June/July 2009.

The desktop review recorded a total of 402 vertebrate species as potentially occurring on Cockatoo Island, this includes: 17 frogs, 91 reptiles, 263 birds and 31 mammal species. Of these, 29 are of high conservation significance (Conservation Significance Level 1), being listed under legislation and 12 are of moderate conservation significance (Conservation Significance Level 2), being listed as priority species by the Department of Environment and Conservation (DEC).

Of the 29 species considered high conservation significance, 5 are migratory marine turtles and 20 are species of birds that may only occur as vagrant visitors. Of the 4 remaining species, 1 is common to the coastal Kimberley region, *Crocodylus porosus*, and the remaining 3 have been recorded on nearby islands or the mainland.

The site inspection and opportunistic observations recorded a total of 57 vertebrate fauna species including 10 reptiles, 44 birds and 3 mammals. Of the 57 species observed, 4 are considered conservation significant and include 2 birds, the White-bellied Sea Eagle (*Haliaeetus leucogaster*) and Rainbow Bee Eater (*Merops ornatus*) 1 reptile, the Salt water Crocodile (*Crocodylus porosus*) and 1 mammal, the Water Rat (*Hydromys chrysogaster*).

Aprasia understands that the JV will be responsible for removing mining related infrastructure. From a fauna perspective there are a number of issues to consider. Firstly, some infrastructures (such as old buildings) have become fauna habitat. Buildings will need to be carefully inspected for resident fauna prior to their demolishing. It will also be important to carefully consider the removal of concrete pads from under buildings. Over time, some fauna species will have tunnelled under these and they will now serve as habitat.

Direct impacts upon conservation significant fauna due to mine closure activities are likely to be minimal; therefore, no further investigations into significant species is warranted at this time. Recommendations relating to rehabilitation and mine closure are:

- Place ground cover in the form of logs, rocks and native vegetation brushing into rehabilitation areas;
- Stockpile native logs and medium to large rocks during clearing activities;
- Clean and use the native eucalyptus logs that are currently in the green waste dump;
- Consider including native flowing species and native grass species into rehabilitated areas;
- If artificial water supplies (eg sprinklers) are to be shut off, then consider the timing;
- Have a suitably qualified fauna specialist inspect disused buildings prior to their removal;
- Consider establishing a fauna monitoring program within rehabilitated areas; and
- Consider approaching the regulatory authorities to discuss rehabilitation and in particular, what fauna information they will require to assist in signing off on the project.

1.0 Introduction

Cockatoo Island is located in the Buccaneer Archipelago, approximately 135 km north of Derby in the Kimberley region of Western Australia. Cockatoo Island was initially mined for iron ore by BHP Billiton Iron Ore Pty Ltd (BHPBIO)between 1951 and 1985. In the period between 1995 and 2000, a joint venture between Portman Iron Ore Ltd and Angang Australia Pty Ltd processed three low grade stockpiles on the island, in an operation known as the Beneficiation Project. The Cockatoo Mining Pty Ltd Joint Venture (JV) commenced in 2000 between HWE Mining Pty Ltd and Cliffs Natural Resources Pty Ltd Asia Pacific Iron Ore (formerly Portman Iron Ore Ltd) with the Embankment Project. The Embankment Project involves mining a high-grade iron ore deposit below the sea level, through staged seawall construction. A third stage of mining on Cockatoo Island was recently approved and the associated seawall is currently being constructed. It is anticipated that mining will continue until 2012.

As part of the proposed mine closure planning, Aprasia Wildlife Pty Ltd (Aprasia) was commissioned by the JV to conduct a desktop review and site inspection in an effort to identify vertebrate fauna and fauna habitat potentially occurring on Cockatoo Island.

The aim of the site visit was to familiarise Aprasia with the project area and to identify significant habitat types. Prior to the site inspection, Aprasia reviewed the list of fauna expected to occur based on fauna habitats present, with a focus on investigating the likelihood of significant species being present on the island.

Aprasia understands that under agreement with BHPBIO, the Cockatoo JV must remove or bury the infrastructure associated with BHPBIO's leases, and rehabilitate any disturbed areas as part of the closure agreement.

1.1 Study Objectives

The objectives of fauna studies in the Environmental Impact Assessment (EIA) process are broadly to determine the fauna values of a site and the likely impacts of a proposed development. This provides government agencies with the information needed to assess the significance of impacts under State and Federal legislation. However, as mining on Cockatoo Island is nearing completion, there are no new impacts or mine development proposed; as such, this review is intended to identify gaps in knowledge, relating to the faunal values of the island.

The key objectives of this fauna study are to:

- review the list of fauna expected to occur on the island, with emphasis on investigating the likelihood of significant species being present;
- identify habitats that are considered significant or fragile on the island;
- identify any significant ecological processes on the island upon which fauna may depend; and
- identify opportunities to enhance fauna habitat during the mine rehabilitation process.

2.0 Background

2.1 Regional Description

The Buccaneer Archipelago consists of over 800 islands, a small number of which form the northern boundary of Yampi Sound. The islands and nearby mainland are part of a former rugged coastline, which has been submerged to a depth of 60 metres and once represented hills surrounding the lowlands that now form the sea floor of the Sound.

The topography of Cockatoo Island is variable, consisting of low sinuous ridges, rugged hill country containing fractured rock and irregular shorelines with numerous rocky headlands. The exposed rocks consist of alternating hard and soft ferruginous beds and the action of tropical weathering has resulted in the rugged topography and an irregular coastline.

Cockatoo Island lies within the Northern Kimberley (NK1 – Subregion Mitchell) of the Interim Biogeographical Regionalisation for Australia (IBRA) (Figure 1) classification system (EA 2000; McKenzie *et al.* 2003). The coastline includes extensive coastal archipelagos (e.g. Buccaneer, bonaparte, Osborne Is, Eclipse Is and Sir Graham Moore Is) that form a microcosm of the NK1 subregion. Environment Australia (2000) commented that an "intact fauna persists in this bioregion, including threatened and endemic species".

2.2 Climate

The climate is semi-arid monsoon, having only two seasons; the "wet" and the "dry". Almost all of the rainfall, for which the average is between 800 – 1200mm, is derived from monsoonal rains, cyclones and thunderstorms between November and April. During the dry season, the days are warm to hot and the humidity is low. In the wet season, temperatures are high to very high, frequently in excess of 40^{o}C, and the humidity is high.

2.3 Habitat

The vegetation on the island is primarily a low open woodland or woodland of *Eucalyptus miniata*, with *Eucalyptus tetrodonta, Corymbia cadoph*ora and *Atalaya hemiglauca* sometimes present, over shrublands and tall shrublands of *Acacia holosericea*, *Calytrix exstipulata*, *Distichistemon hispidulus, Grevillea refracta* and *Buchanania obovata* over *Acacia hippuroides, Hibbertia oblongifolia* low open shrublands and grasses such as *Triodia bitextura*, *T. bynoei* and *Heteropogon contortus*. The woodland is often separated by linear bands of grassland (often *Triodia bitextura*) growing on rocky outcrops. The deeper gullies and coastal faces support elements of maritime vine thicket vegetation, with *Diospyros maritima, Mimusops elengi, Exocarpos latifolius, Sersalisia sericea*, *Flagellaria indica* and *Ampelocissus acetosa* common, but mixed with sclerophyllous vegetation, rather than forming thickets. The western end of the island also supports a heath of *Grevillea wickhamii* and *Acacia translucens* and *Triodia spp*. grasslands with scattered shrubs such as *Mimusops elengi* and *Cajanus acutifolius* (M. Henson *pers.com*).

The island contains areas of fractured rocky outcropping, with boulders and crevices. Deep gullies dissect the island, providing steep cliff faces that descend to rocky shorelines.

There are occasional sandy beaches around the island and occasional mangal communities in areas where sediments have accumulated.

2.4 Previous Surveys

An early assessment of avian species on Cockatoo Island was conducted by John Warham in 1965 during a visit to the Kimberley region of Western Australia. Warham (1957) observed 40 species of birds on Cockatoo Island and commented that this avifauna has not previously been recorded. To date, no formal fauna assessment has been undertaken on Cockatoo Island; however, there has been assessment of nearby Koolan Island and there is an ongoing study of the northern Kimberley islands being conducted by the WA Department of Environment and Conservation (DEC).

3.0 Methods

3.1 Approach

This fauna assessment of Cockatoo Island and subsequent report preparation were carried out with reference to guidance and position statements published by the WA Environmental Protection Authority (EPA) on fauna surveys and environmental protection, and Commonwealth biodiversity legislation (e.g. EPA 2002; EPA 2004).

The field assessment undertaken was an extended site inspection consisting of a Level 1 with some elements of Level 2 according to Guidance Statement 56 (EPA, 2004). The aim of the field component was to gain an understanding of habitats and ecological processes, whilst searching for evidence of significant species. In an effort to enhance the chances of determining the presence of one particular conservation significant species (*Dasyurus hallucatus*), some limited trapping was conducted.

3.2 Personnel

The following personnel were involved in the desktop assessment, site inspection and report preparation:

- Mr Ian Harris; BSc. (Conservation Biology/Environmental Science) Hons, (Wildlife Management); and
- Ms Michelle de Souza; BE. (Environmental Engineering) Hons.

Figure 1 IBRA Subregions in Western Australia. Note Cockatoo Island lies in Northern Kimberley (NK1 – Subregion Mitchell)

3.3 Sources of Information for desktop assessment

Baseline information for this fauna assessment was drawn primarily from the WA Museum's Naturemap (2009), with expected bird species additionally drawn from Birds Australia Atlas Database. Information was also collated from the *Environmental Protection and Biodiversity Conservation Act* (EPBC Act) Protected Matters Search Tool and the DEC Threatened Fauna Database (Table 1). Information on expected species in the area was based on general patterns of distribution sourced from frogs (Tyler *et al.* 2000), reptiles (Storr *et al.* 1983, 1990, 1999 and 2002), birds (Blakers *et al.* 1984; Johnstone and Storr 1998; Johnstone and Storr, 2004 and Simpson and Day 2000), mammals (Churchill 1998; Strahan 1995 and Menkhorst and Knight 2001).

Table 1: Database source, types of records held and area searched

Database	Type of records held on database	Area searched
Faunabase (WA Museum)	Records of specimens held in the WA Museum.	123°37' 00'' E,16°05' 35'' S; Buffer=15km
Birds Australia Atlas Database	Records of bird observations in Australia, 2007.	Lat: -17 00 00 Long: 124 00 00 to Lat: -16 00 00 Long: 125 00 00 and Lat: -17 00 00 Long: 123 00 00 to Lat: -16 00 00 Long: 124 00 00
DEC Threatened and Priority Fauna Database	Information and records on Threatened and Priority species in Western Australia	15.6354° S 123.1434° E to 16.5509 °S 124.0860° E plus 50km buffer.
EPBC Protected Matters Search Tool	Records on matters protected under the EPBC Act, including threatened species and conservation estate.	16.0210,123.5215, -16.1814,123.5215, -16.1814,123.9214, -16.0210,123.9214 plus 50 km buffer

3.4 Licences and Permits

The site inspection and limited trapping effort was conducted under DEC Regulation 17 licence, number SF006946.

3.5 Site Inspection and Field Survey

The site inspection was conducted from the 30th June – 4th July 2009 with the aim of familiarising Aprasia with the Cockatoo Island mining operations and rehabilitation requirements. During this inspection, the study area was traversed on foot to identify habitat types present and to evaluate rehabilitated areas from a fauna-use perspective.

Work consisted of:

- traversing the island to identify the major habitat types;

- searching for evidence of fauna, especially evidence of significant species such as diggings and burrows, caves, tracks and scats, etc.
- spotlighting and listening for nocturnal species;
- opportunistic observations, including bird-watching; and
- targeted trapping for the Northern Quoll (*Dasyurus hallucatus*).

3.6 Searching for significant species

Significant species identified during the desktop assessment as potentially occurring on Cockatoo Island include species that are observable from evidence of their activities. This included the Northern Quoll (*Dasyurus hallucatus,* searching for scats, tracks and hair), Ghost Bat (*Macroderma gigas*) and Orange Leaf-nosed Bat (*Rhinonicteris aurantius*, roosting caves). Areas containing habitat suitable for these species were traversed on foot in an effort to determine their presence. Information on other significant species (e.g. birds) was obtained using regular transects through the area and inspection of suitable nearby habitats.

3.7 Trapping

In addition to hand searching and opportunistic observations, limited trapping of the area was also conducted. Twenty-four Elliot traps were placed in two transects within habitat suitable for Northern Quoll (Figure 2). Traps were placed at regular intervals; however, spacing between traps was determined by habitat and suitable sites to place traps (eg within crevices or under rock ledges, where traps were protected from the sun). Elliot traps were baited with universal bait. Trapping was conducted over 4 nights from the 30th June – 4th July 2009.

3.8 Spotlighting

Spotlighting was conducted on the nights of the 2nd and 3rd of July 2009 and was carried out on foot, using head-torches (head-torching), and from a vehicle using the vehicle headlights. Spotlighting began post-sunset and all species encountered were recorded and in some cases, captured for identification.

3.9 Opportunistic surveys

At all times, observations of fauna were noted when they contributed to the accumulation of information on the fauna of the site. These included such casual observations as birds, reptiles and mammals seen while travelling through the site.

3.10 Bat surveys

Formal bat surveys using acoustic recordings or mist netting were not conducted during the site inspection; however, observations of bats roosting in buildings was made and where possible, identification was undertaken.

3.11 Limitations

The site assessment undertaken was intended to enhance Aprasia's understanding of the Cockatoo Island minesite operations and mine closure requirements. While limited

targeted trapping was undertaken, the trap effort should not be viewed as a full fauna survey.

3.12 Assessment of Conservation Significance

The conservation status of fauna species is assessed under both Commonwealth and State Acts, including:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) and the
- Western Australian *Wildlife Conservation Act 1950*.

The levels of significance used to address fauna listed under the *EPBC Act* are those recommended by the International Union for the Conservation of Nature and Natural Resources (IUCN) and reviewed by Mace and Stuart (1994). The *EPBC Act* also lists migratory species that are recognised under international agreements/treaties, including:

- China Australia Migratory Bird Agreement (CAMBA);
- Japan Australia Migratory Bird Agreement (JAMBA); and the
- Bonn Convention (The Convention on the Conservation of Migratory Species of Wild Animals).

The *Wildlife Conservation Act, 1950* uses a set of Schedules but also classifies species using some of the IUCN categories (described in Appendix 1). In Western Australia, the DEC has produced a list of Priority Fauna that are not considered threatened under the *Wildlife Conservation Act;* however, in relation to these species, DEC has determined that there is cause for concern.

In addition, the Federal Department of Environment, Heritage, Water Resources and the Arts (DEHWRA, formerly Environment Australia) has supported the publication of reports on the conservation status of most vertebrate fauna species e.g. reptiles (Cogger *et al.* 1993), birds (Garnett and Crowley 2000), monotremes and marsupials (Maxwell *et al.* 1996), rodents (Lee 1995) and bats (Duncan *et al.* 1999); while the Threatened Species and Communities Section of DEHWRA has produced a list of Threatened Australian Fauna, although this list is effectively a precursor to the list produced under the *EPBC Act.* These publications also use the IUCN categories, although those used by Cogger *et al.* (1993) and Wager and Jackson (1993) differ in some respects as these reports pre-date Mace and Stuart's review (1994).

Fauna species included under conservation acts and/or agreements are formally recognised as being of conservation significance under State or Federal legislation. Species listed only as Priority by DEC, or that are included in publications such as Garnett and Crowley (2000) and Cogger *et al.* (1993) but not included in State or Commonwealth legislation, are also of recognised conservation significance.

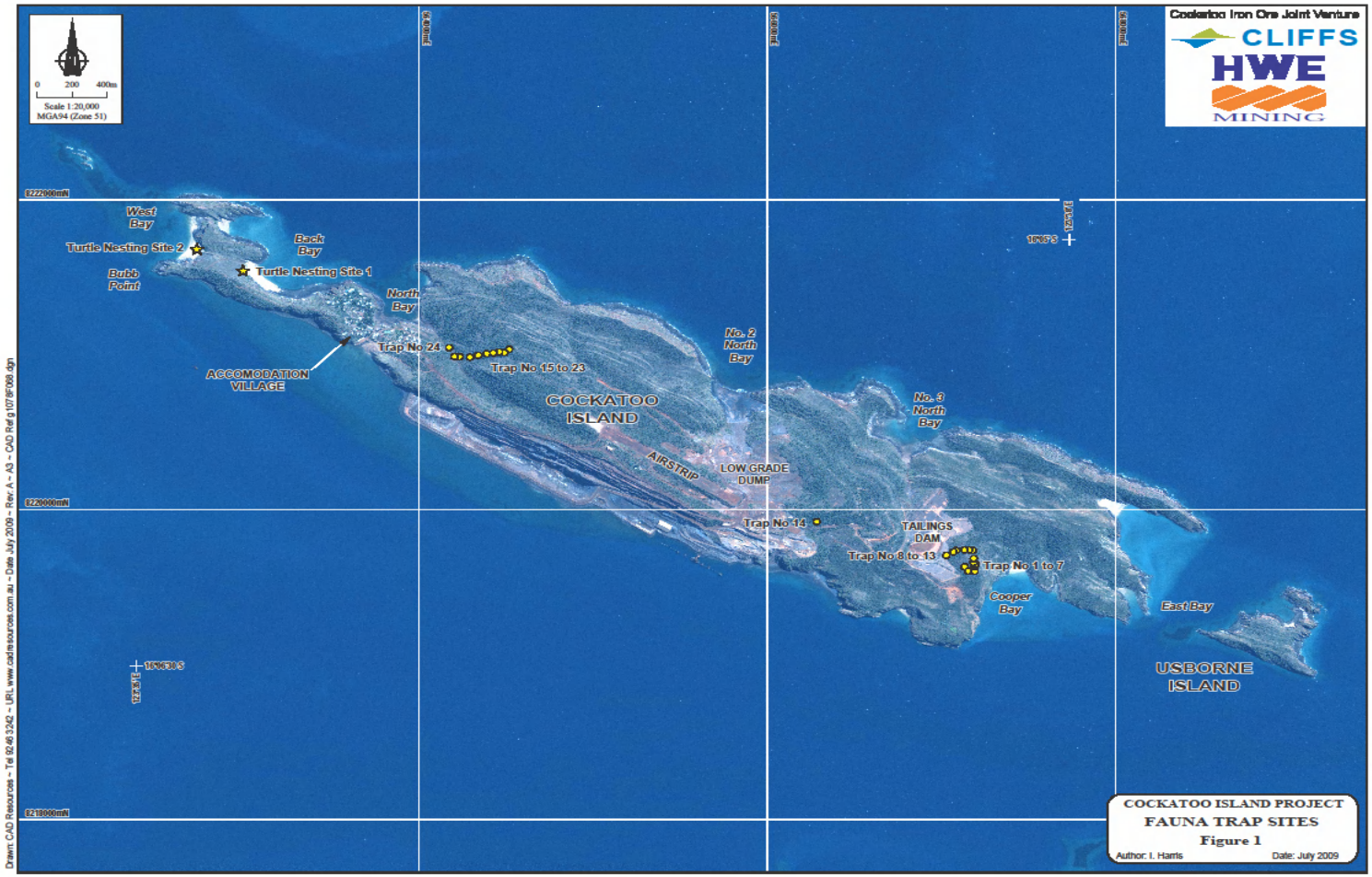

Figure 2: Cockatoo Island showing trap locations and turtle nesting sites (yellow stars).

On the basis of the above comments, two levels of conservation significance are recognised in this report:

Conservation Significance (CS) 1: Species listed under State or Commonwealth Acts; and

Conservation Significance (CS) 2: Species not listed under State or Commonwealth Acts

Species that have been introduced (INT) are indicated.

4.0 Results

4.1 Fauna habitats

Rocky Outcrops

Occur across the island particularly along steep gullies. This habitat type is well represented across the island and shows little evidence of disturbance.

Fractured boulders

Occur across the island and often hidden under *Acacia* thickets or *Triodia* species. This habitat type is well represented across the island.

Spinifex Grassland

Occur across the island, often over broken rocky outcrops. This habitat type is well represented across the island.

Eucalyptus Woodland

Eucalypt spp dominate across the island both in gullies and along side rocky extrusions. Eucalyptus woodlands are well represented across the island.

Sandy Beach

Only four locations contain sandy beaches, Cooper Bay, East Bay, Back Bay and West Bay. This habitat type is restricted on the island and is not well represented.

Rocky Extrusions dominated by *Triodia*

Rocky extrusions occur across the island and are generally dominated by *Triodia*. This habitat type occurs in bands and is well represented across the island.

Mangal Communities

Mangal communities are very restricted and only occur in bays where sediments have accumulated over time. The areas containing mangroves include: East bay, No 3 North Bay and a small cove north west of Usborne Island (as shown on Figure 2).

No photo available

Sandy Flat (Tailings Storage facility)

The tailings storage facility rehabilitation area covers approximately 12.5 and can currently be considered as sandy flat habitat.

The Village

The village on Cockatoo Island has been identified as habitat due to the ongoing water supply (Photo sourced J. Macfayden).

4.2 Vertebrates

Vertebrate fauna potentially occurring within the study area are presented in Section 9.1 (Tables 1-4).These lists are based largely upon known species distributions and available habitats. Table 5-6 of Section 9.1 lists those species considered to be of conservation significance and details their respective conservation status.

4.2.1 Amphibians

Based on the desktop review, a total of 17 frog species potentially occur within the survey area (see Section 9.1 Table 1). Based on the databases searched, there are no frog species of conservation significance expected to occur. No frog species were recorded during the 2009 site visit.

4.2.2 Reptiles

A total of 91 reptile species potentially occur within the survey area (Section 9.1Table 2) with 9 of the reptile species considered to be conservation significance. These are discussed below.

Conservation Significance Level 1

Estuarine Crocodile *Crocodylus porosus*

Estuarine Crocodile is classified as Specially Protected Fauna under the Schedule 4 of the *Wildlife Conservation Act, 1950* and listed as Migratory under the *EPBC Act, 1999.* Inhabits coastal rivers and swamps extending inland along water courses and occasionally seen at sea (Wilson and Swan 2005).

The following species of marine turtle are expected to occur in Kimberley waters.

Loggerhead Turtle	*Caretta caretta*
Green Turtle	*Chelonia mydas*
Leatherback Turtle	*Dermochelys coriacea*
Hawksbill Turtle	*Eretmochelys imbricata*
Flatback Turtle	*Natator depressus*

Buccaneer Burrowing skink *Lerista praefrontalis*

Lerista praefrontalis is classified as Schedule 1 of the *Wildlife Conservation Act, 1950*. It is only known from the Buccaneer Archipelago

Conservation Significance Level 2

Ctenotus yampiensis

Ctenotus yampiensis is classified as Priority *2* by DEC. This species in know to occur in subhumid Kimberley from Mt Elizabeth and Yampi Peninsula (Storr *et.al*. 1999)

Koolan Island Blind Snake *Ramphotyphlops yampiensis*

The Koolan Island Blind Snake is classified as Priority 2 by DEC. This species predominantly feeds on ant and termite larvae and is only known from one specimen obtained from Koolan Island (Australian Museum 2009).

4.2.3 Birds

At least 266 bird species potentially occur within the survey area (Section 9.1 Table 3). This list includes species that may only occur as vagrants in standing bodies of water or along shore lines, 24 of the bird species that may occur in the study area are considered to be of conservation significance and are discussed below.

Conservation Significance Level 1

Great Egret	*Ardea alba*
Cattle Egret	*Ardea ibis*
Oriental Plover	*Charadrius veredus*
Oriental Pratincole	*Glareola maldivarum*
Little Curlew	*Numenius minutus*
Eastern Curlew	*Numenius madagascariensis*
Painted Snipe	*Rostratula australis*
Fork-tailed Swift	*Apus pacificus*
Streaked Shearwater	*Puffinus leucomelas*
Bridled Tern	*Sterna anaethetus*
Barn Swallow	*Hirundo rustica*
White-bellied Sea-Eagle	*Haliaeetus leucogastar*
Rainbow Bee-eater	*Merops ornatus*
Derby White-browed Robin	*Poecilodryas superciliosa cerviniventris*
Partridge Pigeon	*Geophaps smithii*

The above species are listed as migratory under the JAMBA, CAMBA and/or Bonn Convention, and as such are also protected under the *EPBC Act, 1999.* Those species covered under JAMBA are also protected under Schedule 3 of the *Wildlife Conservation Act 1950*.

Gouldian Finch *Erythura gouldiae*

The Gouldian Finch is listed as Endangered under the *EPBC Act.* Garnett and Crowley (2000) commented that there appears to be a variety of reasons for their decline including trapping, parasitic mites and pastoralism. Changes in food resources as a result of grazing and frequent burning appears to be the main threatening process affecting this taxon.

Red Goshawk *Erythrotriorchis radiatus*

The Red Goshawk is listed as Vulnerable under the *EPBC Act* and rare or likely to become extinct under the *Wildlife Conservation Act 1950.* The Red Goshawk is known to occur in coastal and sub-coastal areas in wooded and forested lands of tropical northern Australia. The Red Goshawk's diet consists mainly of bird species with habitat loss identified as likely to continue to be the biggest threat to the viability of the species (DEWHA 2009).

Northern Shrike-tit *Falcunculus frontatus*

The Northern Shrike-tit is listed as Vulnerable under the *EPBC Act* and Endangered under the *Wildlife Conservation Act 1950.* The Northern subspecies of the Crested Shrike-tit is insectivorous and inhabits eucalypt open woodlands where it forages in trees, especially in eucalypts. The Northern subspecies of the Crested Shrike-tit is probably adversely affected by frequent hot fires that reduce insect abundance (DEWHA 2009).

Masked Owl *Tyto novaeseelandiae*

The Masked Owl is listed as Vulnerable under the *EPBC Act* and classified as priority 1 under the *Wildlife Conservation Act 1950.* Masked Owls inhabits bush lands and well timbered waterways. They are a nocturnal species that prey rodents, reptiles, birds, insects and small mammals.

Conservation Significance Level 2

Peregrine Falcon *Falco peregrinus*

The Peregrine Falcon is classified as Specially Protected Fauna under the Schedule 4 of the *Wildlife Conservation Act 1950.* This species occurs in a variety of habitats and may breed in areas surrounding the project area, possibly utilising tree hollows or cliff edges in nearby hills and gullies.

Australian Bustard *Ardeotis australis*

The Australian Bustard is classified as Priority 4 by the DEC and Near Threatened by Garnett and Crowley (2000). This species is associated with a variety of grassland, grassy woodland and shrubland habitats, with the main threats to its survival being a combination of habitat loss/degradation and predation by feral cats and foxes.

Bush Stone-curlew *Burhinus grallarius*

The Bush Stone-curlew is classified as Priority 4 by the DEC and Near Threatened by Garnett and Crowley (2000). It is often associated with woodlands and shrublands along ephemeral or permanent watercourses (M. Bamford *pers. Comm*).

Pictorella Mannikin *Heteromunia pectoralis*

Pictorella Mannikin is classified as Priority 4 by the DEC and listed as Near Threatened by Garnett and Crowley (2000). Although the main threat to this taxon is thought to be over-grazing of habitat and fire, its preference for woodland and grassland habitats near water (Garnett and Crowley 2000) may make it susceptible to any changes that impact on riparian systems.

Black Bittern *Ixobrychus flavicollis*

The Black Bittern is classified as Priority 3 by the DEC and is found across the northern portion of Australia along waterways, where it feeds on aquatic fauna. Preferred nesting sites are in trees.

4.2.4 Mammals

A total of 31 mammal species potentially occur in the study area, including 30 native and 1 introduced species (Section 9.1 Table 4). A total of 8 native mammals that may occur on Cockatoo Island are considered to be of conservation significance and these are discussed below.

Conservation Significance Level 1

Northern Quoll *Dasyurus hallucatus*

The Northern Quoll is listed as Endangered under the *Wildlife Conservation Act 1950* and Vulnerable under the EPBC Act. The increased conservation status of *Dasyurus hallucatus* is partially due to the negative impact of Cane Toads *Bufo marinus* in parts of the Quoll's range, and the threat that cane toads pose to this species. This species has been recorded on a number of Kimberley islands, including nearby Koolan Island and is often associated with rocky areas but also occurs along watercourses.

Golden Bandicoot *Isoodon auratus auratus*

The Golden Bandicoot is listed as Endangered under both the *EPBC Act* and *Wildlife Conservation Act 1950*. Severely declining on the mainland since the introduction of livestock, populations in the Kimberley are now restricted to reserves and two offshore islands (Palmer *et. al* 2003).

Golden-backed Tree Rat *Mesembriomys macrurus*

The Golden-backed Tree Rat is listed as Endangered under the *EPBC Act* 1999 and Priority 4 by DEC. Now thought to be confined to near coastal areas of the Kimberley, this species has been previously recorded on offshore islands (Palmer *et. al* 2003).

Brush-tailed Tree-rat *Conilurus penicillatus*

The Brush-tailed Tree-rat Rat is listed as Vulnerable under the *EPBC Act* 1999 and occurs in monsoonal northern Australia. In the Kimberley region of Western Australia, it is only known from a few near coastal areas. Its diet consists largely of vegetable matter including grasses and seeds, but has been recorded feeding on termites. Habitat preference is open forest with grassy understorey, this species may be exposed to local extinction if habitat is altered or destroyed (Strahan 2004).

Conservation Significance Level 2

Ghost Bat *Macroderma gigas*

The Ghost Bat is listed as Priority 4 by the DEC and Lower Risk (near threatened) by Duncan *et. al.* (1999). This cave-roosting bat is threatened by disturbance, introduced predators and loss of roost sites.

Orange Leaf-nosed Bat *Rhinonicteris aurantius*

The Orange Leaf-nosed Bat is classified as Priority 2 by the DEC. Occurring throughout the Kimberley region and across the top end (Strahan 2004), this insectivorous species roosts during the day in very warm humid caves. The Orange Leaf-nosed Bat is very sensitive to human interference and may completely abandon its roost if frequently disturbed.

Northern Leaf-nosed-bat *Hipposideros stenotis*

The Northern Leaf-nosed-bat is classified as Priority 2 by the DEC. Occurring in cracks and caves along the western escarpment of Arnhem Land plateau, it has also been recorded from Derby and Koolan Island in the Kimberley region of Western Australia (Strahan 2004).

Water Rat (rakali) *Hydromys chrysogaster*

The Water Rat is classified as Priority 4 by the DEC and is found in the vicinity of permanent bodies of fresh or brackish waters. Foods for this taxon include aquatic insects, fish, crustaceans, frogs, lizards and small mammals (Strahan 2004).

4.3 Rehabilitation

There are currently five previously disturbed areas under rehabilitation on Cockatoo Island, these include:

- the tailings storage facility;
- pit 5;
- the old metal dump;
- the stockpile scats; and
- the historic waste dump.

Inspection of these areas indicated varying degrees of success (actual plant growth); however, with the exception of some bird species, utilisation by fauna is currently restricted as all areas lack suitable ground cover in the form of logs, rocks and brushing. Implications for this are discussed in Section 5.4.

5.0 Discussion

5.1 Habitat Representation

The major fauna habitat types as listed in Section 4.3 are all well represented across the island, with the exception of sandy beaches and mangal communities. The small areas of sandy beach may be important as turtles nesting sites; however, there appears to minimal use of the areas. Observations made on other Kimberley islands suggest that sandy beaches are important nesting grounds for marine turtles. Sandy beaches that are frequented by numerous individuals often show signs of activity (old depressions where eggs have been laid), given that only two such depressions were observed, it would appear that nesting on these beaches may be restricted to a few individuals. This may be partly due to the small area available and the fact the beaches on Cockatoo Island are subject to occasional inundation during extreme tides. This not withstanding, there is little evidence of human disturbance and minesite closure will not impact these areas.

The small mangal communities were not visited during the site visit. These areas are virtually inaccessible by land, due to the rough terrain. It is expected that these areas will be habitat to species not yet recorded on the island, as these areas have not been accessed.

5.2 Fauna

The site inspection recorded 57 species of fauna present on Cockatoo Island. While the database search identified over 400 species as potentially occurring, many of these species require specialised habitat which may not occur on the island. Database searches take into account a “buffer area” around an identified location. In the case of Cockatoo Island, this has meant that parts of the mainland have been included in the search and therefore, many of the species identified as potentially occurring may in reality be restricted to the mainland.

Some of the species identified as potentially occurring within the project area have been recorded at nearby locations such as Koolan Island. Such confirmed recordings are significant because Cockatoo Island is located in close proximity and in the case of the Northern Quoll (a species of conservation significance), it is not unreasonable to have expected their presence. Muir 1994 commented that it is unlikely that *D. hallucatus* occurs on Cockatoo Island this comment was based on the fact that long standing mine workers had not recorded seeing one. Limited targeted trapping during the 2009 site visit did not record *D. hallucatus*.

Cockatoo Island has a long history of human disturbance, including the introduction of cats Warham (1956). Warham (1956) commented that Pheasant Coucals had been plentiful in and around the accommodation area, but the introduction of cats had seen the numbers decrease. If *D. hallucatus* had once been present, then the introduction of a

predator species may have removed them. Interestingly, during the 2009 site visit, no Pheasant Coucals were observed.

The limited trapping conducted during the 2009 site visit confirmed the presence of the Common Rock Rat *Zyzomys argurus,* with 6 individuals captured.

Of the 44 species of bird recorded on the island, only two are of conservation significance: the White Belled Sea Eagle, *Haliaeetus leucogaster* and Rainbow Bee Eater, *Merops ornatus.* Both of these species are classed as Migratory and are commonly recorded in the Kimberley and Pilbara regions.

It is anticipated that many more fauna species will occur on Cockatoo Island than have been recorded to date; however, it is anticipated that mine closure and subsequent rehabilitation of disturbed areas will not impact on these species regardless of the total number of present.

5.3 General Impacts on Fauna

Cockatoo Island has a long history of human usage, yet there is very little information on the islands faunal assemblage. An early assessment of the avian species was conducted by John Warham in 1956, where he identified 40 species on the island. Of particular interest is that Warham (1956) commented that the bird's water needs appeared to be served by the village sprinklers, as there was little fresh water available on the island. Observation during the 2009 site visit confirmed that many species of bird were utilising the water supplied in the village, it may be that in the event of a total withdrawal by the JV'S operations, a gradual reduction in the availability of water should be considered. It may be that if the water was just "shut off" many individuals would simply perish (depending on the seasonal conditions), as they may have become reliant on this artificial supply.

Mine closure and subsequent water cut off might best occur at the onset of the wet season, to enable fauna to access water received during the wet.

5.4 Impacts on Significant Species

Operations on Cockatoo Island have been ongoing for many years and infrastructure has been in place for this time. Aprasia understands that the only planned disturbances in the future are for decommissioning of infrastructure and rehabilitation of these areas. Based on this understanding, it would appear that the final closure planning would not adversely affect significant species and therefore, no additional work is warranted in relation to significant species at this time.

5.5 Rehabilitation

Some of the areas that have been previously disturbed have been rehabilitated to varying degrees. When assessing these areas from a fauna use point of view, there are two important factors that need to be considered:

1. ground cover (eg rocks, logs and brushing); and
2. species composition (eg diversity)

5.5.1 Ground Cover

Ground cover in the form of rocks, logs and brushing is important for many species. It provides habitat, protecting individuals from predators and the elements. Ground cover also provides a means of protection for ground dwelling species that need to traverse an area. This is extremely important, particularly in areas that have dissected habitat (eg the tailings storage facility). Cover in the form of logs and branches not only provides habitat, but is also an important food source for invertebrates, such as termites. Providing vegetative material in rehabilitated areas may encourage invertebrates, which in turn, will be a food source for many species, especially lizards and insectivorous birds.

There are opportunities to provide cover in rehabilitated areas; for example, there are currently large trunks from native eucalyptus trees in the green waste dump. These logs have been cut into small lengths that will be easy to manage; furthermore, some of these logs contain small hollows that would be ideally suited to many species. These logs could be removed from the green waste dump, washed down with water (to remove any weed or introduced species seed) and then scattered into rehab areas.

It is also noted that as there will be large areas to rehabilitate in the future, a policy of stockpiling any cleared or pruned native vegetation should be considered. This material would then be available to scatter on rehab areas after they have been prepared for seeding. Stockpiling of large rocks should be considered for the same reasons.

5.5.2 Species Composition

Plant species composition is important to fauna as it will provide cover and a food source; however, as the areas of rehab are generally small and there are very large areas of undisturbed vegetation, it may be prudent to focus the rehabilitation on stabilising an area, rather than focusing on planting species specifically for fauna use.

Aprasia understands that recommendations on flora species composition will be provided by a botanical consultant; however, where possible, if native flowering species can be introduced (food source for nectar feeders) and native grasses (food source for granivorous species both bird and mammal), this would assist in availing the rehab areas to native fauna.

5.6 Rehabilitation Monitoring

Vegetative monitoring will need to occur in an effort to determine the success of rehabilitation. From a fauna perspective, it may be beneficial to conduct a long term monitoring exercise of rehabilitated sites in an effort to obtain data on fauna usage. This data can then be presented to regulatory authorities in support of the rehabilitation success of an area.

5.7 Infrastructure Decommissioning

Aprasia understands that the JV will be responsible for removing mining related infrastructure. From a fauna perspective there are a number of issues to consider. Firstly,

some infrastructure (such as old buildings) have become fauna habitat. This is demonstrated by the small colony (approximately 25) of Common Sheathtail Bats (*Taphozous georgianus*) that roost in an old building adjacent to the explosive magazine. Removal of this building should be carried out over a period of several days, with work commencing in the evening. If the building is simply knocked down during the day, there may be direct mortality of bats or indirect mortality through disturbed individuals being exposed or predated on by birds as they leave the roost.

One approach would be to remove a small portion of the roof one evening. This would enable the bats to leave under the cover of darkness, it may be that they will return the following morning; however, it is expected that as parts of the roof are missing, an excess of daylight will make the roost unattractive and the bats will move on.

Buildings will need to be carefully inspected for resident fauna prior to their demolishing. It will also be important to carefully consider the removal of concrete pads from under buildings. Over time, some fauna species will have tunnelled under these and they will now serve as habitat. Particular care should be taken when excavating these pads as large species such as goannas, pythons and mulga snakes may be resident and they will be easily damaged.

5.8 Regulatory Requirements

Aprasia understands that a final decision has not been made on the closure requirements for Cockatoo Island. As there has been almost no information obtained on the faunal assemblage of the island and therefore very little is known, it may be appropriate for the JV to approach the regulatory authorities when timing is convenient and enquire as to how much detail they will require to assist in assessing mine closure success and subsequent bond relinquishing. This will enable the JV to plan works accordingly and will reduce the chances of unnecessary work being performed.

6.0 Recommendations

The following recommendations should be considered as part of the mine closure and land rehabilitation plan:

Recommendation 1

Place ground cover in the form of logs, rocks and native vegetation brushing into rehabilitation areas.

Reason

Native fauna will benefit from the placement of such structures, as they will provide habitat and protection from both the elements and predatory species.

Recommendation 2

Stockpile native logs and medium to large rocks during clearing activities.

Reason

The stockpiled material can be used as required in areas under rehabilitation.

Recommendation 3

Clean and use the native eucalyptus logs that are currently in the green waste dump.

Reason

These logs would be ideal fauna habitat as many contain small hollows.

Recommendation 4

Consider including native flowing species and native grass species into rehabilitated areas.

Reason

Flowering species will provide a food source for nectar feeding species such as honeyeaters and grass species will provide a food source for granivorous species such as finches and native rats.

Recommendation 5

If artificial water supplies (eg sprinklers) are to be shut off, then consider the timing.

Reason

Many bird species may have become reliant on this water source and a sudden cessation of water supplies during the dry season may induce a number of bird deaths, particularly if they have become reliant on this source.

Recommendation 6

Have a suitably qualified fauna specialist inspect disused buildings prior to their removal.

Reason

Fauna has been identified as using some buildings as habitat. Demolishing building without due care may result in unnecessary fauna deaths

Recommendation 7

Consider establishing a fauna monitoring program within rehabilitated areas.

Reason

When considering the success of rehabilitated areas, being able to demonstrate use by fauna may assist regulatory authorities in decision making.

Recommendation 8

Consider approaching the regulatory authorities to discuss rehabilitation and in particular, what fauna information they will require to assist in signing off on the project.

Reason

Establishing an open relationship prior to the commencement of the rehabilitation process may assist the JV in fully understanding its obligations.

7.0 Acknowledgements

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9.0 Appendices

9.1 Tables

9.1.1 TABLE 1. Frogs Recorded (+) or potentially occurring on Cockatoo Island

Levels of Conservation Significance are discussed in the "Assessment of Conservation Significance" section.

Species		Conservation Significance	Recorded
Hylidae (tree-frogs)			
Giant Frog	*Cyclorana australis*		
Hedden-ear Frog	*Cyclorana cryptotis*		
Long-foted Frog	*Cyclorana longipes*		
Northern Dwarf Tree Frog	*Litoria bicolor*		
Green Tree Frog	*Litoria caerulea*		
Copland's Rock Frog	*Litoria coplandi*		
Peters Frog	*Litoria inermis*		
Rocket Frog	*Litoria nasuta*		
Pale Frog	*Litoria pallida*		
Roth's Tree Frog	*Litoria rothii*		
Desert Tree Frog	*Litoria rubella*		
Magnificent Tree Frog	*Litoria spendida*		
Tornier's Frog	*Litoria tornieri*		
Wotjulum Frog	*Litoria wotjulumensis*		+
Myobatrachidae (ground-frogs)			
Billingual Froglet	*Crinia bilingua*		+
Ornate Frog	*Limnodynastes ornatus*		
Derby Toadlet	*Uperoleia aspera*		
Total 17			

9.1.2 TABLE 2. Reptiles Recorded (+) or potentially occurring on Cockatoo Island.

Levels of Conservation Significance are discussed in the "Assessment of Conservation Significance" section.

Species		Conservation Significance	Recorded
Reptiles			
Crocodylidae			
Estuarine Crocodile	*Crocodylus porosus*	CS1	+
Sea Turtles			
Loggerhead Turtle	*Caretta caretta*	CS1	
Green Turtle	*Chelonia mydas*	CS1	
Leatherback Turtle,	*Dermochelys coriacea*	CS1	
Hawksbill Turtle	*Eretmochelys imbricata*	CS1	
Flatback Turtle	*Natator depressus*	CS1	
Gekkonidae (geckos)			
Clawless Gecko	*Crenadactylus ocellatus*		
Fat-tailed Gecko	*Diplodactylus conspicillatus*		
	Gehyra australis		+
	Gehyra nana		
	Gehyra occidentalis		
	Gehyra pilbara		
	Gehyra xenopus		
	Gehyra punctata		
Bynoe's Gecko	*Heteronotia binoei*		+
	Heteronotia planiceps		+
	Oedura gracilis		
	Oedura obscura		
Zigzag Velvet Gecko	*Oedura rhombifer*		
Western Giant Cave Gecko	*Pseudothecadactylus cavaticus*		
	Strophurus mcmillani		
Asian House Gecko	*Hemidactylus frenatus*	Int	
Pygopodidae (legless-lizards)			
	Delma borea		
	Lialis burtonis		+
Agamidae (dragon lizards)			
Chameleon Dragon	*Chelosania brunnea*		
Frill-necked Lizard	*Chlamydosaurus kingii*		
Gilbert's Dragon	*Amphibolurus gilberti*		
	Diporiphora bennettii		

Reptiles Species (cont)		Conservation Significance	Recorded
Varanidae (goannas or monitor lizards)			
Spiny-tailed Monitor	*Varanus acanthurus*		
Black-palmed Rock Monitor	*Varanus glebopalma*		
Kimberley Rock Monitor	*Varanus glauerti*		
Merten's Water Monitor	*Varanus mertensi*		
Mitchell's water Monitor	*Varanus mitchelli*		
Spotted Tree Monitor	*Varanus scalaris*		
Tree Monitor	*Varanus tristis*		
Scincidae (skinks)			
	Carlia amax		
	Carlia johnstonei		
	Carlia munda		
	Carlia triacantha		+
Fence Skink	*Cryptoblepharus plagiocephalus*		
	Ctenotus inornatus		+
	Ctenotus militaris		
	Ctenotus robustus		
	Ctenotus yampiensis	CS2	
Giant Slender Blue-tongue	*Cyclodomorphus maximus*		+
	Egernia douglasi		
	Glaphyromorphus isolepis		
Buccaneer Burrowing Skink	*Lerista praefrontalis*	CS1	
	Lerista walkeri		
	Menetia greyii		
	Menetia maini		
	Morethia ruficauda		
	Notoscincus ornatus		
	Tiliqua scincoides		
Typhlopidae (blind snakes)			
Koolan Blind Snake	*Ramphotyphlops yampiensis*	CS2	
	Ramphotyphlops kimberleyensis		
	Ramphotyphlops troglodytess		
Boidae (pythons**)**			
Childrens Python	*Antaresia childreni*		
Stimson's Python	*Antaresia stimsoni*		
Black-headed Python	*Aspidites melanocephalus*		
Water python	*Liasis mackloti*		

Olive Python	*Liasis olivaceus olivaceus*		+
Colubridae			
Brown Tree Snake	*Boiga irregularis*		
Green Tree Snake	*Dendrelaphis punctulata*		
White-bellied Mangrove Snake	*Fordonia leucobalia*		
Richard's Mangrove Snake	*Myron richardsonii*		
Elapidae (front fanged snakes)			
Northern Death Adder	*Acanthophis praelongus*		
Northern Shovel-nosed Snake	*Brachyyurophis roperi*		
Olive Whipsnake	*Demansia olivacea*		
Great Black Whipsnake	*Demansia papuensis*		
Yellow-faced Whipsnake	*Demansia psammophis*		
Moon Snake	*Furina ornata*		
Taipan	*Oxyuranus scutellatus*		
Mulga Snake	*Pseudechis australis*		+
Ringed Brown Snake	*Pseudonaja modesta*		
Gwardar	*Pseudonaja nuchalis*		
Little Spotted Snake	*Suta punctata*		
Hydrophiinae (sea snakes)			
Horned Seasnake	*Acalyptophis peronii*		
Short-nosed Seasnake	*Aipysurus apraefrontalis*		
Dubois' Seasnake	*Aipysurus duboisii*		
Spine-tailed Seasnake	*Aipysurus eydouxi*		
Olive Seasnake	*Aipysurus laevis*		
Stokes' Seasnake	*Astrotia stokesii*		
Spectacled Seasnake	*Disteira kingii*		
Olive-headed Seasnake	*Disteira major*		
Turtle-headed Seasnake	*Emydocephalus annulatus*		
Black-ringed Seasnake	*Hydrelaps darwiniensis*		
Beaked Seasnake	*Enhydrina schistosa*		
Elegant Seasnake	*Hydrophis elegans*		
Spine-bellied Seasnake	*Lapemis hardwickii*		
Yellow-bellied Seasnake	*Pelamis platurus*		
Total 91			**10**

9.1.3 TABLE 3. Birds Recorded (+) or potentially occurring on Cockatoo Island.

Levels of Conservation Significance are discussed in the "Assessment of Conservation Significance" section.

Species		Conservation Significance	Recorded
Megapodiidae(megapodes)			
Orange-footed Scrubfowl	*Megapodius reinwardt*		
Phasianidae (pheasants and quails)			
Brown Quail	*Coturnix ypsilophora*		
King Quail	*Coturnix chinensis*		
Procellariidae (petrels, shearwaters)			
Streaked Shearwater	*Puffinus leucomelas*	CS1	
Anseranatidae			
Magpie Goose	*Anseranas semipalmata*	CS1	
Anatidae (ducks and swans)			
Pacific Black Duck	*Anas superciliosa*		
Chestnut Teal	*Anas castanea*		
Grey Teal	*Anas gracilis*		
Australian wood Duck	*Chenonetta jubata*		
Plumed Whistling Duck	*Dendrocygna eytoni*		
Black Swan	*Cygnus atratus*		
Pink-eared Duck	*Malacorhynchus membranaceus*		
Hardhead	*Aythya australis*		
Podicipedidae			
Hoary-headed Grebe	*Poliocephalus poliocephalus*		
Australasian Grebe	*Tachybaptus novaehollandiae*		
Columbidae (pigeons and doves)			
Emerald Dove	*Chalcophaps indica*		
Rock Dove	*Columba livia*		
Common Bronzewing	*Phaps chalcoptera*		
Flock Bronzewing	*Phaps histrionica*		
Crested Pigeon	*Ocyphaps lophotes*		

Bird Species (cont)		Conservation Significance	Recorded
Spinifex Pigeon	*Geophaps plumifera*		
White-quilled Rock Pigeon	*Petrophassa albipennis*		
Diamond Dove	*Geopelia cuneata*		
Peaceful Dove	*Geopelia striata*		+
Bar-shouldered Dove	*Geopelia humeralis*		+
Partridge Pigeon (Western Form)	*Geophaps smithii*	CS1	
Rose-crowned Fruit-Dove	*Ptilinopus regina*		
Podargidae (frogmouths)			
Tawney Frogmouth	*Podargus strigoides*		
Eurostopodidae			
Spotted Nightjar	*Eurostopodus argus*		
Aegothelidae (owlet-nightjars)			
Australian Owlet - nightjar	*Aegotheles cristatus*		
Apodidae (swifts)			
Fork-tailed Swift	*Apus pacificus*	CS1	
Fregatidae (frigatebirds)			
Lesser Frigatebird	*Fregata ariel*		+
Anhingidae			
Darter	*Anhinga melanogaster*		
Phalacrocoracidae (cormorants			
Little Pied Cormorant	*Phalacrocorax melanoleucos*		
Little Black Cormorant	*Phalacrocorax sulcirostris*		
Pied Cormorant	*Phalacrocorax varius*		+
Great Cormorant	*Phalacrocorax carbo*		
Pelecanidae (pelicans)			
Australian Pelican	*Pelecanus conspicillatus*		
Ciconiidae (storks)			
Black-necked Stork	*Ephippiorhynchus asiaticus*		
Ardeidae (herons and egrets, bitterns)			
White-necked Heron	*Ardea pacifica*		
Striated Heron	*Butorides striatus*		
Eastern Great Egret	*Ardea modesta*		

Bird Species (cont)		Conservation Significance	Recorded
Intermediate Egret	*Ardea intermedia*		
Great-billed Heron	*Ardea sumatrana*		
Great Egret	*Ardea alba*	CS1	
Cattle Egret	*Ardea ibis*	CS1	
Striated Heron	*Butorides striata*		
Black Bittern	*Ixobrychus flavicollis*	CS2	
Pied Heron	*Egretta picata*		
White-faced Heron	*Egretta novaehollandiae*		
Little Egret	*Egretta garzetta*		
Eastern Reef Egret	*Egretta sacra*		+
Nankeen Night-Heron	*Nycticorax caledonicus*		
Threskiornithidae (ibis and spoonbills			
Glossy Ibis	*Plegadis falcinellus*		
Australian White Ibis	*Threskiornis molucca*		+
Straw-necked Ibis	*Threskiornis spinicollis*		
Royal Spoonbill	*Platalea regia*		
Yellow-billed Spoonbill	*Platalea flavipes*		
Accipitridae (kites, hawks and eagles)			
Eastern Osprey	*Pandion cristatus*		+
Black-shouldered Kite	*Elanus axillaris*		
Black-breasted Buzzard	*Hamirostra melanosternon*		+
Pacific Baza	*Aviceda subcristata*		
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	CS1	+
Whistling Kite	*Haliastur sphenurus*		
Brahminy Kite	*Haliastur indus*		+
Black Kite	*Milvus migrans*		
Brown Goshawk	*Accipiter fasciatus*		
Red Goshawk	*Erythrotriorchis radiatus*	CS1	
Collared Sparrowhawk	*Accipiter cirrocephalus*		
Grey Goshawk	*Accipiter novaehollandiae*		
Spotted Harrier	*Circus assimilis*		
Swamp Harrier	*Circus approximans*		
Wedge-tailed Eagle	*Aquila audax*		
Little Eagle	*Hieraaetus morphnoides*		

Bird Species (cont)		Conservation Significance	Recorded
Falconidae (falcons)			
Nankeen Kestrel	*Falco cenchroides*		
Brown Falcon	*Falco berigora*		
Australian Hobby	*Falco longipennis*		
Black Falcon	*Falco subniger*		+
Peregrine Falcon	*Falco peregrinus*	CS2	
Gruidae (cranes)			
Brolga	*Grus rubicunda*		
Otididae (bustards)			
Australian Bustard	*Ardeotis australis*	CS2	
Burhinidae (stone-curlews)			
Bush Stone-curlew	*Burhinus grallarius*	CS2	
Beach Stone-curlew	*Esacus magnirostris*		
Haematopodidae (oystercatchers)			
Australian Pied Oystercatcher	*Haematopus longirostris*		
Sooty Oystercatcher	*Haematopus fuliginosus*		+
Recurvirostridae (stilts and avocets)			
Black-winged Stilt	*Himantopus himantopus*		
Red-necked Avocet	*Recurvirostra novaehollandiae*		
Charadriidae (Lapwings, Plovers, Dotterels)			
Pacific Golden Plover	*Pluvialis fulva*		
Grey Plover	*Pluvialis squatarola*		
Red-capped Plover	*Charadrius ruficapillus*		
Lesser Sand Plover	*Charadrius mongolus*		
Greater Sand Plover	*Charadrius leschenaultii*		
Oriental Plover	*Charadrius veredus*	CS1	
Black-fronted Dotterel	*Elseyornis melanops*		
Red-kneed Dotterel	*Erythrogonys cinctus*		
Masked Lapwing	*Vanellus miles*		

Bird Species (cont)		Conservation Significance	Recorded
Jacanidae			
Comb-crested Jacana	*Irediparra gallinacea*		
Scolopacidae			
Grey-tailed Tattler	*Heteroscelis brevipes*		
Australian Painted Snipe	*Rostratula australis*	CS1	
Pin-tailed Snipe	*Gallinago stenura*		
Swinhoe's Snipe	*Gallinago megala*		
Black-tailed Godwit	*Limosa limosa*		
Bar-tailed Godwit	*Limosa lapponica*		
Little Curlew	*Numenius minutus*	CS1	
Whimbrel	*Numenius phaeopus*		
Eastern Curlew	*Numenius madagascariensis*	CS2	
Terek Sandpiper	*Xenus cinereus*		
Common Sandpiper	*Actitis hypoleucos*		
Grey-tailed Tattler	*Tringa brevipes*		
Common Greenshank	*Tringa nebularia*		
Marsh Sandpiper	*Tringa stagnatilis*		
Wood Sandpiper	*Tringa glareola*		
Ruddy Turnstone	*Arenaria interpres*		
Asian Dowitcher	*Limnodromus semipalmatus*		
Sanderling	*Calidris alba*		
Red-necked Stint	*Calidris ruficollis*		
Long-toed Stint	*Calidris subminuta*		
Pectoral Sandpiper	*Calidris melanotos*		
Sharp-tailed Sandpiper	*Calidris acuminata*		
Curlew Sandpiper	*Calidris ferruginea*		
Ruff	*Philomachus pugnax*		
Red-necked Phalarope	*Phalaropus lobatus*		
Turnicidae (button-quails)			
Chestnut-backed Button-quail	*Turnix castanotus*		
Little Button-quail	*Turnix velox*		

Bird Species (cont)		Conservation Significance	Recorded
Glareolidae (pratincoles)			
Oriental Pratincole	*Glareola maldivarum*	CS1	
Australian Pratincole	*Stiltia isabella*		
Laridae (skuas, jaegers, gulls, terns)			
Common Noddy	*Anous stolidus*		
Bridled Tern	*Onychoprion anaethetus*	CS1	
Sooty Tern	*Onychoprion fuscata*		
Little Tern	*Sternula albifrons*		
Gull-billed Tern	*Gelochelidon nilotica*		
Caspian Tern	*Hydroprogne caspia*		
Whiskered Tern	*Chlidonias hybrida*		
White-winged Black Tern	*Chlidonias leucopterus*		
Roseate Tern	*Sterna dougallii*		
Common Tern	*Sterna hirundo*		
Lesser Crested Tern	*Thalasseus bengalensis*		
Crested Tern	*Thalasseus bergii*		+
Silver Gull	*Chroicocephalus novaehollandiae*		+
Cacatuidae (cockatoos)			
Red-tailed Black Cockatoo	*Calyptorhynchus banksii*		
Galah	*Eolophus roseicapillus*		
Little Corella	*Cacatua sanguinea*		+
Sulphur-crested Cockatoo	*Cacatua galerita*		
Cockatiel	*Nymphicus hollandicus*		
Psittacidae (lorikeets and parrots)			
Rainbow Lorikeet	*Trichoglossus haematodus*		
Varied Lorikeet	*Psitteuteles versicolor*		
Northern Rosella	*Platycercus venustus*		+
Red-winged Parrot	*Aprosmictus erythropterus*		+
Cuculidae			
Pheasant Coucal	*Centropus phasianinus*		
Eastern Koel	*Eudynamys orientalis*		

Bird Species (cont)		Conservation Significance	Recorded
Channel-billed Cuckoo	*Scythrops novaehollandiae*		
Horsfield's Bronze-Cuckoo	*Chalcites basalis*		
Black-eared Cuckoo	*Chalcites osculans*		+
Little Bronze-Cuckoo	*Chalcites minutillus*		
Pallid Cuckoo	*Cuculus pallidus*		
Brush Cuckoo	*Cacomantis variolosus*		
Oriental Cuckoo	*Cuculus optatus*		
Strigidae (hawk owles)			
Barking Owl	*Ninox connivens*		
Southern Boobook	*Ninox novaeseelandiae*		+
Tytonidae (barn owles)			
Masked Owl	*Tyto novaehollandiae*	CS1	
Eastern Barn Owl	*Tyto javanica*		
Alcedinidae (kingfishers)			
Azure Kingfisher	*Ceyx azureus*		
Blue-winged Kookaburra	*Dacelo leachii*		
Red-backed Kingfisher	*Todiramphus pyrrhopygius*		+
Sacred Kingfisher	*Todiramphus sanctus*		+
Collared Kingfisher	*Todiramphus chloris*		
Meropidae (bee-eaters)			
Rainbow Bee-eater	*Merops ornatus*	CS1	+
Coraciidae			
Dollarbird	*Eurystomus orientalis*		
Climacteridae (treecreepers)			
Black-tailed Treecreeper	*Climacteris melanura*		
Ptilonorhynchidae (bowerbirds)			
Great Bowerbird	*Ptilonorhynchus nuchalis*		+
Maluridae (fairy-wrens)			
Red-Backed Fairy Wren	*Malurus melanocephalus*		
Variegated Fairy-wren	*Malurus lamberti*		
Black Grasswren	*Amytornis housei*		
Acanthizidae			
Weebill	*Smicrornis brevirostris*		
Mangrove Gerygone	*Gerygone levigaster*		

Bird Species (cont)		Conservation Significance	Recorded
Dusky Gerygone	*Gerygone tenebrosa*		
White-throated Gerygone	*Gerygone olivacea*		+
Pardalotidae			
Red-browed Pardalote	*Pardalotus rubricatus*		+
Striated Pardalote	*Pardalotus striatus*		+
Meliphagidae (honeyeaters)			
Singing Honeyeater	*Lichenostomus virescens*		
White-gaped Honeyeater	*Lichenostomus unicolor*		
Grey-headed Honeyeater	*Lichenostomus keartlandi*		
Grey-fronted Honeyeater	*Lichenostomus plumulus*		
Yellow-tinted Honeyeater	*Lichenostomus flavescens*		
White-plumed Honeyeater	*Lichenostomus penicillatus*		
Bar-breasted Honeyeater	*Ramsayornis fasciatus*		
Rufous-throated Honeyeater	*Conopophila rufogularis*		+
Yellow Chat	*Epthianura crocea*		
Black Honeyeater	*Sugomel niger*		
Red-headed Honeyeater	*Myzomela erythrocephala*		
Banded Honeyeater	*Cissomela pectoralis*		
Brown Honeyeater	*Lichmera indistincta*		+
Crescent Honeyeater	*Phylidonyris pyrrhoptera*		
Black-chinned Honeyeater	*Melithreptus gularis*		
White-throated Honeyeater	*Melithreptus albogularis*		+
Blue-faced Honeyeater	*Entomyzon cyanotis*		
Yellow-throated Miner	*Manorina flavigula*		+
White-gaped Honeyeater	*Lichenostomus unicolor*		
Western White-naped Honeyeater	*Melithreptus chloropsis*		
Red-headed Honeyeater	*Myzomela erythrocephala*		
Silver-crowned Friarbird	*Philemon argenticeps*		+
Little Friarbird	*Philemon citreogularis*		+

Bird Species (cont)		Conservation Significance	Recorded
Pomatostomidae (Australian babblers)			
Grey-crowned Babbler	*Pomatostomus temporalis*		
Neosittidae (sittellas)			
Varied Sittella	*Daphoenositta chrysoptera*		
Campephagidae (cuckoo-shrikes)			
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*		+
White-breasted Cuckoo-shrike	*Coracina papuensis subsp. hypoleuca*		
White-winged Triller	*Lalage sueurii*		
Pachycephalidae (shrike- tit and whistlers)			
Northern Shrike-tit	*Falcunculus frontatus*	CS1	
Mangrove Golden Whistler	*Pachycephala melanura*		
Rufus whistler	*Pachycephala rufiventris*		+
White-breasted Whistler	*Pachycephala lanioides*		
Sandstone Shrike-thrush	*Colluricincla woodwardi*		
Grey Shrike-thrush	*Colluricincla harmonica*		
Oriolidae (orioles and figbirds)			
Australasian Figbird	*Sphecotheres vieilloti*		
Olive-backed Oriole	*Oriolus sagittatus*		
Artamidae (woodswallows)			
White-breasted Woodswallow	*Artamus leucorynchus*		+
Masked Woodswallow	*Artamus personatus*		
Black-faced Woodswallow	*Artamus cinereus*		
Little Woodswallow	*Artamus minor*		+
Pied Butcherbird	*Cracticus nigrogularis*		+
Australian Magpie	*Cracticus tibicen*		

Bird Species (cont)		Conservation Significance	Recorded
Phipiduridae			
Grey Fantail	*Rhipidura albiscapa*		
Mangrove Grey Fantail	*Rhipidura phasiana*		
Northern Fantail	*Rhipidura rufiventris*		+
Willie Wagtail	*Rhipidura leucophrys*		+
Corvidae (ravens and crows)			
Little Crow	*Corvus bennetti*		
Torresian Crow	*Corvus orru*		
Monarchidae			
Broad-billed Flycatcher	*Myiagra ruficollis*		+
Leaden Flycatcher	*Myiagra rubecula*		+
Shining Flycatcher	*Myiagra alecto*		
Restless Flycatcher	*Myiagra inquieta*		
Magpie-lark	*Grallina cyanoleuca*		+
Petroicidae			
Jacky Winter	*Microeca fascinans*		
Lemon-bellied Flycatcher	*Microeca flavigaster*		
Red-capped Robin	*Petroica goodenovii*		
Hooded Robin	*Melanodryas cucullata*		
Derby White-browed Robin	*Poecilodryas superciliosa cerviniventris*	CS1	
Mangrove Robin	*Peneonanthe pulverulenta*		
Alaudidae			
Horsfields Bushlark	*Mirafra javanica*		
Cisticolidae			
Golden-headed Cisticola	*Cisticola exilis*		
Megaluridae			
Tawny Grassbird	*Megalurus timoriensis*		
Little Grassbird	*Megalurus gramineus*		
Rufous Songlark	*Cincloramphus mathewsi*		
Brown Songlark	*Cincloramphus cruralis*		
Timaliidae			
Yellow White-eye	*Zosterops luteus*		+

Bird Species (cont)		Conservation Significance	Recorded
Hirundinidae (swallows)			
Barn Swallow	*Hirundo rustica*	CS1	
Welcome Swallow	*Hirundo neoxena*		
Fairy Martin	*Petrochelidon ariel*		
Tree Martin	*Petrochelidon nigricans*		
Nectariniidae			
Mistletoebird	*Dicaeum hirundinaceum*		+
Estrildae (finches)			
Zebra Finch	*Taeniopygia guttata*		
Gouldian Finch	*Erythrura gouldiae*	CS1	
Doubled-barred Finch	*Taeniopygia bichenovii*		+
Long-tailed Finch	*Poephila acuticauda*		
Masked Finch	*Poephila personata*		
Crimson Finch	*Neochmia phaeton*		
Star Finch	*Neochmia ruficauda*		
Painted Finch	*Emblema pictum*		
Chestnut-breasted Mannikin	*Lonchura castaneothorax*		
Pictorella Mannikin	*Heteromunia pectoralis*	CS2	
Motacillidae (pipits and true wagtails)			
Australasian Pipit	*Anthus novaeseelandiae*		
Yellow Wagtail species	*Motacilla flava*		
Total 267			**45**

9.1.4 TABLE 4. Mammals Recorded (+) or potentially occurring on Cockatoo Island.

Levels of Conservation Significance are discussed in the "Assessment of Conservation Significance" section.
(n): denotes recorded near site

Species		Conservation Significance	Recorded
Tachyglossidae (echidnas)			
Echidna	*Tachyglossus aculeatus*		
Dasyuridae (carnivorous marsupials)			
Northern Quoll	*Dasyurus hallucatus*	CS1	
Long-tailed Planigale	*Planigale ingrami*		
Common Planigale	*Planigale maculata*		
Peramelidae (bandicoots and bilbies)			
Golden bandicoot	*Isoodon auratus*	CS1	
Northern Brown Bandicoot	*Isoodon macrourus*		
Phalangeridae			
Scaly-tailed Possum	*Wyulda squamicaudata*		
Northern Brushtail Possum	*Trichosurus vulpecula*		
Macropodidae			
Agile Wallaby	*Macropus agilis*		
Monjon	*Petrogale burbidgei*		
Short-eared Rock-wallaby	*Petrogale brachyotis*		
Nabarlek	*Petrogale concinna*		
Pteropodidae			
Black Flying Fox	*Pteropus alecto*		
Little Red Flying Fox	*Pteropus scapulatus*		
Molossidae (freetail bats)			
Megadermatidae (false vampire bats)			
Ghost Bat	*Macroderma gigas*	CS2	
Hipposideridae			
Orange Leaf-nosed Bat	*Rhinonicteris aurantius*	CS2	
Northern Leafnosed-bat	*Hipposideros stenotis*	CS2	
Emballonuridae (			
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*		
Emballonuridae (			
Common Sheathtail-bat	*Taphozous georgianus*		+
Vespertilionid			
Arnhem Land Long-eared Bat	*Nyctophilus arnhemensis*		
Little Broad-nosed Bat	*Scotorepens greyii*		
Western Cave Bat	*Vespadelus caurinus*		

Mammal Species (cont)		Conservation Significance	Recorded
Muridae			
Golden-backed Tree-rat	*Mesembriomys macrurus*	CS1	
Brush-tailed Tree-rat	*Conilurus penicillatus*	CS1	
House Mouse	*Mus musculus*	Int	
Delicate Mouse	*Pseudomys delicatulus*		
Water Rat (rakali)	*Hydromys chrysogaster*	CS2	+
Pale Field-rat	*Rattus tunneyi*		
Common Rock-rat	*Zyzomys argurus*		+
Kimberley Rock-rat	*Zyzomys woodwardi*		
Total 30			**3**

9.1.5 TABLE 5. Potential species of conservation significance within the Cockatoo Island area (CS1).

Species Name		**Conservation Status (EPBC Act)**	**Conservation Status (WA Act)**
Reptiles			
Estuarine Crocodile	*Crocodylus porosus*	Migratory	Sch 4 Specially protected fauna
Loggerhead Turtle	*Caretta caretta*	Endangered	Endangered
Green Turtle	*Chelonia mydas*	Vulnerable	Vulnerable
Leatherback Turtle	*Dermochelys coriacea*	Endangered	Vulnerable
Hawksbill Turtle	*Eretmochelys imbricat*	Vulnerable	Vulnerable
Flatback Turtle	*Natator depressus*	Vulnerable	Vulnerable
Buccaneer Burrowing Skink	*Lerista praefrontalis*		Vulnerable
Birds			
Red Goshawk	*Erythrotriorchis radiatus*	Vulnerable	Vulnerable
Northern Shrike-tit	*Falcunculus frontatus*		Endangered
Gouldian Finch	*Erythura gouldiae*	Endangered	Endangered
Partridge Pigeon (western)	*Geophaps smithii blaauwi*	Vulnerable	Vulnerable
Australian Painted Snipe	*Rostratula australis*	Vulnerable	Vulnerable
Masked Owl	*Tyto novaehollandiae*	Vulnerable	P1
Mammals			
Northern Quoll	*Dasyurus hallucatus*	Vulnerable	Endangered
Brush-tailed Tree-rat	*Conilurus penicillatus*	Endangered	
Golden Bandicoot	*Isoodon auratus auratus*	Vulnerable	Vulnerable

Golden-backed Tree Rat	*Mesembriomys macrurus*	Vulnerable	P4
Migratory Terrestrial Birds			
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	Migratory	
Barn Swallow	*Hirundo rustica*	Migratory	
Rainbow Bee-eater	*Merops ornatus*	Migratory	wa
Western Partridge Pigeon	*Petrophassa smithii blaauwi*	Migratory	
Derby White-browed Robin	*Poecilodryas superciliosa cerviniventris*	Migratory	

Species Name		**Conservation Status**	**Conservation Status (WA Act)**
Migratory Wetland Species			
Great Egret,	*Ardea alba*	Migratory	
Cattle Egret	*Ardea ibis*	Migratory	
Oriental Plover,	*Charadrius veredus*	Migratory	
Oriental Pratincole	*Glareola maldivarum*	Migratory	
Little Curlew	*Numenius minutus*	Migratory	
Painted Snipe	*Rostratula benghalensis*	Migratory	
Migratory Marine Birds			
Fork-tailed Swift	*Apus pacificus*	Migratory	
Streaked Shearwater	*Calonectris leucomelas*	Migratory	
Bridled Tern	*Sterna anaethetus*	Migratory	
Little Tern	*Sterna albifrons*	Migratory	

9.1.6 TABLE 6. Potential species of conservation significance within the Cockatoo Island area (CS2).

Species Name		Conservation Status (WA Act)
Reptiles		
Rough-scaled python	*Morelia carinata*	P1
Koolan Island Blind Snake	*Ramphotyphlops yampiensis*	P2
	Ctenotus yampiensis	P2
Birds		
Black Bittern	*Ixobrychus flavicollis*	P3
Masked Owl (northern)	*Tyto novaehollandiae kimberli*	P3
Peregrine Falcon	*Falco peregrinus*	
Australian Bustard	*Ardeotis australis*	P4
Bush Stone-curlew	*Burhinus grallarius*	P4
Eastern Curlew	*Numenius madagascariensis*	P4
Pictorella Mannikin	*Heteromunia pectoralis*	P4
Flock Bronzewing	*Phaps histrionica*	P4
Mammals		
Monjon	*Petrogale burbidgei*	P4
West Kimberley Rock-wallaby	*Petrogale lateralis*	
Ghost Bat	*Macroderma gigas*	P4
Northern Leafnosed-bat	*Hipposideros stenotis*	P2
Water Rat (rakali)	*Hydromys chrysogaster*	P4
Scaly-tailed Possum	*Wyulda squamicaudata*	P3

9.2 Appendix 1. Categories used in the assessment of conservation status.

IUCN categories (based on review by Mace and Stuart 1994**) as used for the Environmental Protection and Biodiversity Conservation (EPBC) Act and the WA Wildlife Conservation Act**.

Extinct. Taxa not definitely located in the wild during the past 50 years.
Extinct in the Wild. Taxa known to survive only in captivity.
Critically Endangered. Taxa facing an extremely high risk of extinction in the wild in the immediate future.
Endangered. Taxa facing a very high risk of extinction in the wild in the near future.
Vulnerable. Taxa facing a high risk of extinction in the wild in the medium-term future.
Near Threatened. Taxa that risk becoming Vulnerable in the wild.
Conservation Dependent. Taxa whose survival depends upon ongoing conservation measures. Without these measures, a conservation dependent taxon would be classed as Vulnerable or more severely threatened.
Data Deficient (Insufficiently Known). Taxa suspected of being Rare, Vulnerable or Endangered, but whose true status cannot be determined without more information.
Least Concern. Taxa that are not Threatened.

Schedules used in the WA Wildlife Conservation Act.

Schedule 1. Rare and Likely to become Extinct.
Schedule 2. Extinct.
Schedule 3. Migratory species listed under international treaties.
Schedule 4. Other Specially Protected Fauna.

WA Department of Conservation and Land Management Priority species (species not listed under the Conservation Act, but for which there is some concern).

Priority 1. Taxa with few, poorly known populations on threatened lands.

Taxa which are known from a few specimens or site records from one or a few localities on lands not managed for conservation.

Priority 2. Taxa with few, poorly known populations on conservation lands.

Taxa which are known from a few specimens or site records from one or a few localities on lands not under immediate threat of habitat destruction or degradation.

Priority 3. Taxa with several, poorly known populations, some on conservation lands.

Taxa which are known from a few specimens or site records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation.

Priority 4. Taxa in need of monitoring. Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change.

Priority 5. Taxa in need of monitoring (conservation dependant). Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years (IUCN Conservation Dependent).

9.3 Appendix 2. Annotated species list (birds)

Columbidae (pigeons and doves)

Bar-shouldered - Doves - commonly observed around the village.

Peaceful Doves - A single pair of was observed adjacent to the town beach.

Fregatidae (frigatebirds)

Several individuals were observed flying over the island and a group of seven birds were observed circling over the pit area.

Phalacrocoracidae (cormorants)

A single Pied Cormorant was observed roosting on the ship loader.

Ardeidae (herons and egrets, bitterns)

A single Eastern Reef Egret was observed at low tide on the northern side of the island below the lookout.

Threskiornithidae (ibis and spoonbills)

A single Australian White Ibis was observed daily outside of the village squash court.

Accipitridae (kites, hawks and eagles)

A group of three White-bellied Sea-Eagles were commonly observed circling above the island. Single sightings of Eastern Osprey, Black-breasted Buzzard, and Brahminy Kite were recorded.

Falconidae (falcons)

A single Brown Falcon was observed roosting in a tree adjacent to the explosive battery.

Haematopodidae (oystercatchers)

A pair of Sooty Oystercatchers was observed at low tide near the ship loader.

Laridae (skuas, jaegers, gulls, terns)

A single Crested Tern was recorded roosting on the ship loader. Silver Gulls were observed individually and in small flocks on each day of the site visit.

Cacatuidae (cockatoos)

A flock of approximately 15 Little Corella's were observed daily. It appeared that this flock arrived on the island daily and then returned to the mainland in the late afternoon.

Psittacidae (lorikeets and parrots)

A single pair of Northern Rosella's were recorded near he airstrip on one occasion. Red-winged Parrot were recorded in eucalyptus woodland daily, either in pairs or groups of four.

Cuculidae

A single call of the Black-eared Cuckoo was recorded from eucalyptus woodland near the lookout.

Strigidae (hawk owles)

Calls of the Southern Boobook Owl were recorded on two nights, both times two birds were heard calling.

Alcedinidae (kingfishers)

A single Red-backed Kingfisher was recorded roosting on a power line in the village and a Sacred Kingfisher was recorded near the workshop.

Meropidae (bee-eaters)

Rainbow Bee-eaters were observed all over the island, however, they were in greater numbers adjacent to the village and along the pit cliff.

Ptilonorhynchidae (bowerbirds)

A single Great Bowerbird was recorded on a rocky outcrop in eucalyptus woodland adjacent to the village. Despite site personnel indicating that these birds were common, only one individual was recorded.

Acanthizidae

A single White-throated Gerygone was recorded on two occasions in the gully along the trap line.

Pardalotidae

Both the Red-browed Pardalote and Striated Pardalote were regularly recorded across the island. Both species appeared to be common within the eucalyptus woodland.

Meliphagidae (honeyeaters)

The honeyeaters were the most common group of birds recorded during the site visit. Most common of all were the Brown Honeyeater, which were recorded in large numbers across all habitat types on the island. White-throated Honeyeater's were also common in eucalyptus woodland and Rufous-throated Honeyeaters were recorded occasionally. A pair of Yellow-throated Miners was observed on one occasion at the airstrip. Silver-crowned Friarbird's and Little Friarbird's were also common to eucalyptus woodland across the island.

Campephagidae (cuckoo-shrikes)

Black-faced Cuckoo-shrike's were commonly observed across the island in all habitat types.

Pachycephalidae (shrike- tit and whistlers)

A single Rufus whistler was recorded on two occasions within eucalyptus woodland near the lookout however, this species did not appear to be common.

Artamidae (woodswallows)

A single White-breasted Woodswallow was observed on one occasion near the workshop. Little Woodswallows were recorded daily flying over the cliff face and workshop area. Pied Butcherbirds were recorded at the village usually early in the morning.

Phipiduridae

Pair of Northern Fantails were recorded at the village on one occasion. This pair was observed by the top pool. Willie Wagtails were common across the island often seen on tracks, around the office and village.

Monarchidae

Both the Leaden Flycatcher and Broad-billed Flycatcher were observed in small numbers both in eucalyptus woodland and in the village. A male Broad-billed Flycatcher was regularly observed dipping in the top swimming pool.

Magpie-larks were commonly observed at the village, airstrip and workshop areas.

Timaliidae

Yellow White-eye were observed in eucalyptus woodland on several occasions.

Nectariniidae

Mistletoebirds were recorded across the island and appeared to be common. Often seen in pairs flying over rehab areas and between areas of woodland.

Estrildae (finches)

The Doubled-barred Finch was regularly recorded in grassy areas and around the village. A nest was observed with a sump outside of the workshop area. This species appeared common, though only seen in pairs or groups of three – four.