February 2009

RAIL OPERATIONS

CHICHESTER DEVIATION SIGNIFICANT SPECIES MANAGEMENT PLAN

Revision A

IRON ORE

bhpbilliton

Table of Contents

Tables

Figures

Appendices

EXECUTIVE SUMMARY

To increase the efficiency of transporting iron ore from operations in the Pilbara region to Port Hedland, BHP Billiton Iron Ore (BHPBIO) will construct 23 km of dual track railway through the Chichester Ranges (known as the Chichester Deviation). The Chichester Deviation will deviate from the Port Hedland to Newman Mainline at Ch 220 km and re-join the Mainline at Ch 237.

Baseline biological surveys conducted along the rail corridor recorded a number of flora and fauna species of conservation significance. Additional conservation significant species which were not observed during biological surveys for the Project but are considered likely to occur within the Project area are also considered in this Significant Species Management Plan (SSMP).

Control measures have been developed by BHPBIO and are addressed in this SSMP to reduce the potential impacts of the Project to significant species. Management commitments include general control measures for project planning, construction and operations, and specific measures that address potential project impacts on significant species.

No Declared Rare Flora (DRF) have been recorded within the Chichester Deviation Project area to date, however should DRF species be identified within the Project footprint that can not be avoided, BHPBIO will prepare and submit an application(s) to take DRF pursuant to the *Wildlife Conservation Act 1950*. In addition, BHPBIO will maintain appropriate records of impacted flora/fauna species, vegetation associations and/or habitat areas of conservation significance and will report on the management activities of significant species in its Annual Environmental Report (AER).

The management measures, ongoing monitoring programmes and reporting procedures contained in this SSMP have been developed to minimise or avoid the impacts of the Chichester Deviation Project area to all known populations of significant species, as well as those species not currently recorded, however known to occur within the greater Chichester area.

1 INTRODUCTION

1.1 BACKGROUND

BHP Billiton Iron Ore (BHPBIO) propose to increase the efficiency of transporting iron ore from operations in the Pilbara region to Port Hedland, through the construction of 23 km of dual track railway through the Chichester Ranges (known as the Chichester Deviation), located approximately 230 km south of Port Hedland (Figure 1.1). The Chichester Deviation will deviate to the west of the existing Mainline between Shaw Siding and Cowra Siding (i.e. approximately between chainage[1] [Ch] 220 and Ch 237 on the Mainline). The chainage designation for the new rail tracks is D220 to D242.

Initial biological surveys conducted along the rail corridor recorded a number of flora and fauna species of conservation significance. Conservation significant species that were not observed during the biological surveys for the Project, but are considered likely to occur within the Project area, are also considered in this Significant Species Management Plan (SSMP).

1.2 PURPOSE OF THIS PLAN

The purpose of this SSMP is to assist BHPBIO and its contractors in the implementation of appropriate flora and fauna management measures, ongoing monitoring programmes and reporting procedures for significant flora and fauna species during the construction and operation of the Chichester Deviation Project.

1.3 RELEVANT LEGISLATION

The management measures contained within the SSMP have been developed in accordance with the relevant provisions of the *Environmental Protection Act 1986* (EP Act), the *WA Wildlife Conservation Act 1950* (WC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). An overview of the provisions of these Acts that are relevant to the current Chichester Deviation Project is provided below. The information presented herein is intended solely to provide a summary of the subject matter covered and is not intended as a complete summary of all environmental legislation which may be applicable to the Project.

WA Environmental Protection Act, 1986

The EP Act provides for the establishment of the Environmental Protection Authority (EPA), which has the objective of overseeing the prevention, control and abatement of pollution and environmental harm and the conservation, preservation, protection, enhancement and management of the environment. The EPA has developed policies to assist with achieving this objective. These include policies on the use of the precautionary principle, consideration of intergenerational equity, the conservation of biological diversity and ecological integrity and waste minimisation.

Part IV of the EP Act establishes provisions for the EPA to carry out Environmental Impact Assessments (EIA) in WA. Where relevant, the EPA issues and directs proponents to comply with Guidance Statements that contain the EPA's minimum requirements for the protection of elements of the environment such as flora and fauna. *Guidance Statement 51 – Terrestrial flora and vegetation surveys for Environmental Impact Assessment in Western Australia* and *Guidance Statement 56 – Terrestrial fauna surveys for environmental impact*

[1] The 'chainage' is the distance in kilometres south along the Mainline from Port Hedland. The chainages of the Deviation are denoted by the prefix 'D'.

assessment in Western Australia (EPA, 2004b) require proponents to assess flora and fauna of conservation significance in their EIA.

Wildlife Conservation Act, 1950

The WC Act provides for the protection of flora and fauna species of conservation significance. Protected species are identified as either Declared Rare Flora (DRF) or Scheduled Fauna. DRF are plant species that are extant and considered likely to become extinct or rare and therefore in need of special protection. They are listed in the *Wildlife Conservation (Rare Flora) Notice 2005.* Scheduled Fauna are listed in the *Wildlife Conservation (Specially Protected Fauna) Notice 2008.* There are four levels of Scheduled Fauna (i.e. 1 to 4) and a description of each of these conservation levels is provided in Appendix A.

The DEC also maintains a list of four Priority codes for flora, and five Priority codes for fauna. Priority flora and fauna are either poorly known, believed to be uncommon, rare or under threat, but have not been designated DRF or Scheduled Fauna under the WC Act. The WC Act does not provide specific protection for Priority species, however the potential impacts of new proposals on Priority species is generally considered as part of the EIA process under the EP Act (see above).

Environmental Protection and Biodiversity Conservation Act, 1999

The Commonwealth EPBC Act contains a list of flora and fauna species that are nominated as being of 'National Environmental Significance'. The list is divided into groups according to conservation status (Appendix A). The EPBC Act also provides for the protection of migratory bird species listed in the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals), 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).

1.4 RELATIONSHIP BETWEEN THIS PLAN AND OTHER MANAGEMENT PLANS

BHPBIO's Asset Development Projects construction Environmental Management Plan (EMP) will be adopted for the Chichester Deviation Project (BHPBIO, 2008a). The construction EMP provides an overall framework for environmental management for the Project. The construction EMP also contains specific measures regarding management of flora and fauna, which are included in this SSMP.

1.5 SUMMARY OF KEY ISSUES COVERED BY THIS PLAN

Ten significant species (one plant, five bird, three mammal and one potential short range endemic) were recorded during baseline surveys within the Chichester Deviation Project area and an additional 17 significant species are considered likely to occur.

The following sections provide an overview of these species and previous flora and fauna surveys that have been conducted within the Chichester Deviation Project area (Section 2), locations of recorded significant species (Section 3), general environmental management measures to be implemented within the Project area (Section 4) and the specific management measures that are to be used for species of conservation significance (Section 5).

This SSMP is a working document and is to be reviewed periodically during the construction phase in order to allow the incorporation of relevant changes to the conservational status of species and advances in management measures to be included where possible. The level of

management response assigned to species of conservation significance will be reviewed as part of this process. In addition, and where one or more of the management measures described in this SSMP are found to be sub-optimal, a review of the measure(s) will be conducted and alternative control strategies will be implemented where necessary. Any new measures will be developed and implemented in consultation with the DEC and will be documented in a new revision of this SSMP.

1.6 EPA OBJECTIVE

The Environmental Protection Authority (EPA) objectives for management of terrestrial fauna and flora are:

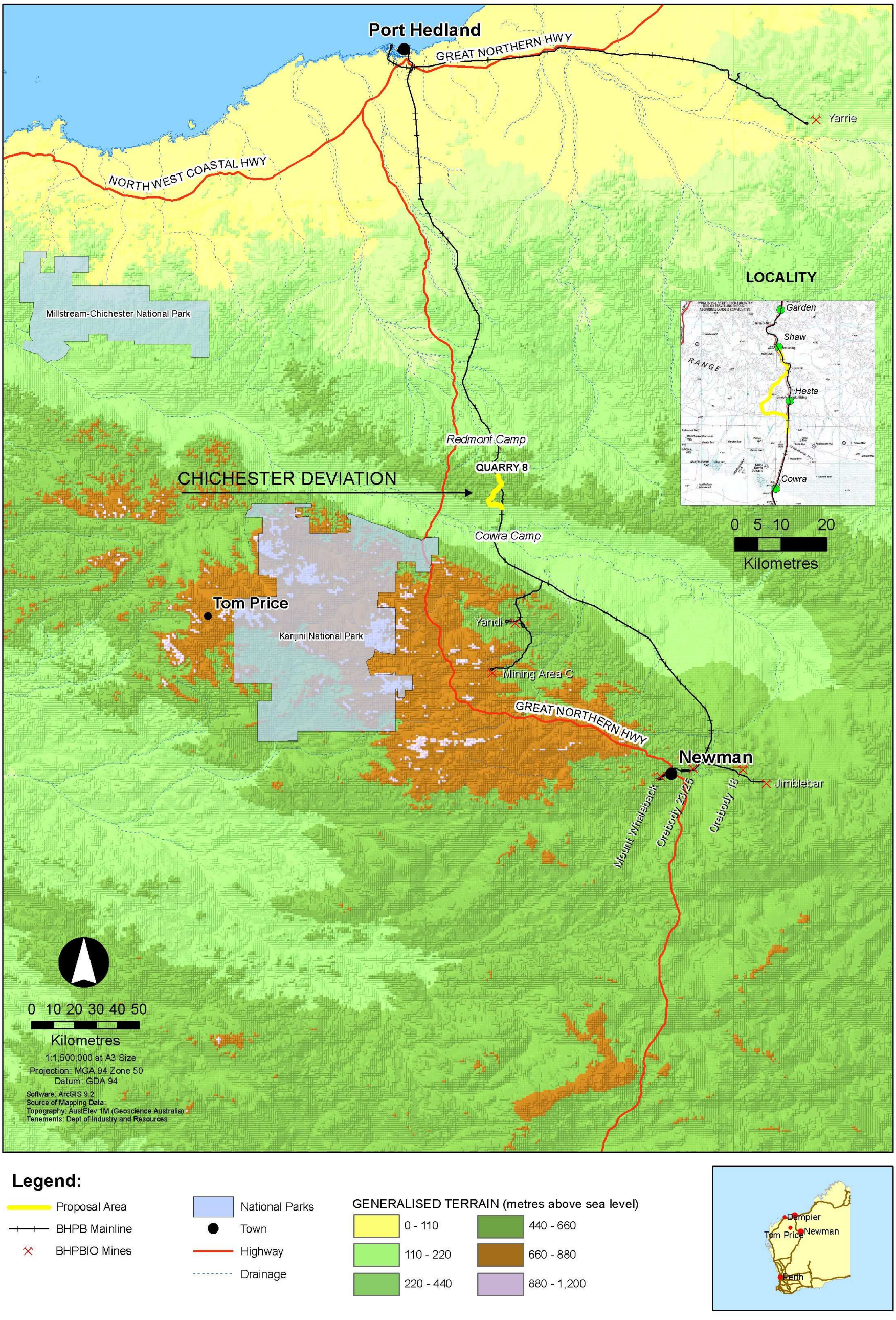
- to maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge; and
- to maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities through the avoidance or management of adverse impacts and improvement in knowledge.

1.7 KEY PERFORMANCE INDICATORS

The overall performance indicators for this SSMP are to ensure that the Project does not result in:

- direct loss of significant flora;
- adverse impact to vegetation outside the approved disturbance corridor; and
- direct loss of significant fauna outside the approved disturbance corridor.

Figure 1.1 – Project Location



1.8 ROLES AND RESPONSIBILITIES

As the proponent, BHPBIO is responsible for the implementation of the Chichester Deviation proposal and adherence to the commitments made within this management plan.

Table 1.1 identifies the responsibilities associated with various positions for the Project.

Table 1.1 – Roles and Responsibilities

Position	Responsibility
Project Manager (Construction Phase)	• Responsible for overall planning of the project to ensure construction is conducted in accordance with the SSMP. • Responsible for compliance with statutory regulations.
Construction Manager (Construction Phase)	• Ensures that the work is continuing in accordance with the SSMP. • Instructs subcontractors on control measures. • Directs site activities according to SSMP. • Ensures all site personnel are aware of any changes to the SSMP and any revised procedures. • Reports to the Site Environmental Officer or Project Manager of any breaches of the SSMP. • Ensures that construction activities support achievement of the Key Performance Indicators (KPIs) set by the SSMP. • Ensures adequate training of all construction and field staff in the requirements of the SSMP.
Operations Manager (Operational Phase)	• Ensures that site work is conducted in accordance with the SSMP. • Instructs subcontractors on control measures. • Directs site activities according to SSMP. • Ensures all site personnel are aware of any changes to the SSMP and any revised procedures. • Reports to the Environmental Manager of any breaches of the SSMP. • Ensures that operational activities support achievement of the KPIs set by the SSMP. • Ensures adequate training of all operational field staff in the requirements of the SSMP.
Environmental Manager (Construction Phase and Operational Phase)	• Ensures that the system for weed management is planned, documented, implemented and maintained in accordance with the SSMP and WMP. • Monitors operations of the SSMP and recommends any necessary changes to the Project Manager (Construction Phase) or

Position	Responsibility
	Operations Manager (Operational Phase). • Provides advice, assistance and direction to the Project Manager (Construction Phase) or Operational Manager (Operational Phase) to ensure operations are conducted in accord with the SSMP.
Site Environmental Officer (Construction Phase)	• Provides advice, assistance and direction to the Environmental Manager to ensure operations are conducted in accord with the SSMP. • Monitors operations of the SSMP and recommends any necessary changes to the Environmental Manager. • Keeps copies of monitoring results. • Ensures that weed hygiene and weed management measures are implemented. • Oversees implementation of environmental controls, monitoring programs, inspections and audits. • Verifies that the requirements set in this SSMP are adequate to the Project scope, should the project scope change. • Assists the construction manager in ensuring that the project team are trained in the requirements of the SSMP. • Completes compliance reporting requirements. • Prepares environmental monitoring reports. • Provides advice with respect to environmental issues where required.
Supervisors	• Implements management actions as directed by the Project Manager, Construction Manager or Site Environmental Officer. • Reports verbally to the Site Environmental Officer, Project Manager or Construction manager any breaches of the SSMP. • Re-iterates the requirements of this SSMP to workgroups through pre-starts and HSEC meetings.
All BHPBIO employees and contractors	• Comply with the requirements of this SSMP. • Comply with legal requirements under the approvals documents and relevant Acts. • Exercise a Duty of Care to the environment. • Report all environmental incidents to an immediate supervisor or the Site Environmental Officer.

2 SUMMARY OF EXISTING SURVEY INFORMATION

2.1 FLORA

Several baseline surveys, impact assessments and studies have been conducted to document and monitor the vegetation associations, flora and fauna within the Chichester Deviation Project area (*ecologia*, 2008a).

A total of 306 flora taxa were identified within the Project area during baseline surveys, consisting predominantly of species from the Poaceae, Mimosaceae and Malvaceae families (*ecologia*, 2008a).

Five populations of *Goodenia nuda* (Priority 3) have been identified within creeklines and drainage channels of the Project area (*ecologia*, 2008a). *G. nuda* is considered to have wide distribution range throughout the Pilbara (*ecologia*, 2008a). The locations of *Goodenia nuda* recorded within the Project area are included in Section 3.1.

Nine vegetation units have been recorded within the Project area (*ecologia*, 2008a). The key characteristics of each association are provided in Table 2.1.

Table 2.1 – Summary of Vegeattion Units within the Chichester Deviation

Habitat	*ecologia* Vegetation Unit	Vegetation Description
Gilgai Plains: Red-Brown Cracking Clay	1	*Astrebla pectinata* tussock grassland
	2	*Acacia xiphophylla* open scrubland
Plain: Open bare areas of hard clay pans with common ferrous pebbles	3	*Acacia aneura* woodland
Drainage areas at the base of the footslope	4a	*Acacia aneura* low open forest
	4b	*Acacia ayersiana* and *Acacia aneura* low open forest
Major creek lines of the flat areas	5	*Acacia citrinoviridis* open low forest
	6	*Acacia citrinoveridis* and *Corymbia hamersleyana* low woodland
Major creek lines of the Chichester Ranges	7a	*Eucalyptus victix* open forest, over *Melaleuca glomerata* shrubland
	7b	*Petalostylis labicheoides* and mixed *Acacia* spp. high shrubland
	7c	*Corymbia* spp. and *Hakea chordophylla* low open woodland
Rocky hill slopes: stone and boulders of ironstone	8a	*Eucalyptus leucophloia* low open woodland, over *Triodia basedowii* hummock grassland
	8b	*Acacia aneura* low woodland
	8c	*Acacia rhodophloia* high shrubland
Drainage channel on rocky hill slopes: stones and bounders of ironstone	9a	Mixed *Acacia* spp. open heath
	9b	*Acacia aneura* low open forest

Three of these vegetation units are considered to have moderate to high local and regional conservation significance (*ecologia*, 2008a):

- mixed tussock grassland on the low lying flats/plains (Vegetation Unit 1);

- *Acacia xiphophylla* medium to tall scrubland (Vegetation Unit 2); and
- moderately dense *Acacia ayersiana* and *Acacia aneura* woodland (Vegetation Unit 4b).

2.2 FAUNA

Ecologia (2008b) identified four major terrestrial fauna habitats within the proposal area:

- Mulga woodland over long unburnt dense grass hummocks;
- Open woodland over dense understory on rocky ground. Dense understory can be patchy;
- Spinifex grassland on rocky hill slope; and
- Regenerating vegetation after recent fire activity.

In addition, six major avian fauna habitats were identified (*ecologia* 2008b):

- Mulga woodland over spinifex hummocks;
- Open woodland over dense grass hummocks;
- Regenerating rocky hill slope after fire;
- Open woodland over dense understory on rocky ground. Dense understory can be patchy;
- Rocky hill side with dense Spinifex hummocks; and
- Burnt Mulga woodland, open canopy with regenerating Spinifex.

The dominant habitat types that may be impacted by construction of the Chichester Deviation are open to very open woodland over Spinifex on rocky soils. These habitat types are widespread throughout the region and adverse impacts to regional biodiversity are not expected. Fauna habitats centred on drainage lines are moderately common in the region hence reductions in diversity are expected to be localised and short-term.

Based on the results of baseline fauna surveys (*ecologia* 2008b), information from previous surveys and database records, 36 native mammal species, 137 bird species, 100 reptile species and 6 amphibian species may potentially occur within the proposal area.

Fauna species of conservation significance which have been recorded within the Chichester Deviation project area to date are listed in Section 3.1.

2.3 SHORT RANGE ENDEMIC FAUNA

Endemism refers to the restriction of species to a particular area (Allen *et al*., 2002). Short range endemism refers to endemic species with restricted ranges, currently defined in Western Australia as less than 10,000 km^2 (100 km x 100 km) (Harvey, 2002). Short range endemic species (SRE) are generally invertebrates.

The Pilbara region contains a large number of arid adapted invertebrate species such as Scorpions, Pseudoscorpions and Centipedes. Other SRE groups that are likely to be found in the proposal area in lesser numbers include Isopods, Mygalomorph spiders and snails (ecologia, 2008c).

Baseline fauna surveys of the Chichester Deviation project area identified a number of specimens from groups containing SRE invertebrate fauna species. These included Scorpions (Scorpiones), Pseudoscorpians (Pseudoscorpionida), Trap-door spiders (Mygalomorphae), Harvestmen (Opiliones) and Centipedes (Chilopoda). Of the specimens collected during the surveys, only one species of trapdoor spider (*Aurecocrypta* "Chichester" sp.), was considered to have a strong likelihood of being a short range endemic species (*ecologia*, 2008c).

The *Aurecocrypta* species occurring within the Chichester Range was found to be an undescribed species. Four male specimens were recorded at two sites within the northern portion of the Chichester Deviation area (Figure 3.1). Five additional rounds of sampling throughout the Chichester Range identified two female specimens (*ecologia*, 2008c).

Examination of WA Museum (WAM) records revealed that the species is widespread across the north of the Western Australia and is not a short range endemic species (*ecologia*, 2008c). WA Museum and *ecologia* records of *Aurecocrypta* "Chichester" sp. specimens are summarised in Table 2.2.

Suitable habitat for many Mygalomorph spiders is limited by the presence of soil in which the spiders dig their burrows. Within the Chichester Range, *Aurecocrypta* "Chichester" sp. habitat is generally within areas of *Acacia* vegetation and on rocky slopes (Raven, 2008).

Aurecocrypta "Chichester" sp. will be managed in accordance with the general management measures included in Section 4.

Table 2.2 – Records of *Aurecocrpyta* "Chichester" sp. Specimens

Locality	Details	Easting	Northing
Chichester Range[2]	3 males collected by *ecologia* pitfall trapping (Sept 2007)	708040.0	7549180.0
Chichester Range[3]	1 male collected by *ecologia* pitfall trapping (Sept 2007)	708310.6	7549410.3
Chichester Range	1 female collected by *ecologia* foraging (Jun 2008)	661846.3	7554495.5
Chichester Range	1 female collected by R. Raven foraging with *ecologia* (Aug 2008)	706763.4	7555765.7
Robinson Range	1 male collected by *ecologia* pitfall trapping (Apr 08)	261638.3	7394826.8
Jack Hills	1 male collected by *ecologia* pitfall trapping (July 08)	514033.5	7120203.3
Weld Range	1 male collected by *ecologia* pitfall trapping (Aug 08)	579575.6	7029279.2
Weld Range	1 male collected by *ecologia* pitfall trapping (Aug 08)	562535.5	7019602.2
Hamersley Ranges	Collector Unknown, WAM Record	660758.8	7505926.4
22.1km W of Pannawonica	Collector Unknown, WAM Record	403653.5	7631758.4
West Turner Syncline	Collector Unknown, WAM Record	529965.9	7519215.7
Sulphur Springs	Collector Unknown, WAM Record	720309.4	7665826.1
Sulphur Springs	Collector Unknown, WAM Record	721846.2	7667267.5
Sulphur Springs	Collector Unknown, WAM Record	721846.2	7667267.5
Sulphur Springs	Collector Unknown, WAM Record	720652.3	7668158.4
Sulphur Springs	Collector Unknown, WAM Record	720309.4	7665826.1
Sulphur Springs	Collector Unknown, WAM Record	720309.4	7665826.1
Barlee Ra Nat Reserve	Collector Unknown, WAM Record	340687.9	7448991.2
Tanami, 89k W of Tanami Downs	Collector Unknown, WAM Record	448970.9	7840211.7
Mesa J, 16.6km SW of Pannawonica	Collector Unknown, WAM Record	410259.4	7627423.9
Waramboo, 52.1 k W of Pannawonica	Collector Unknown, WAM Record	343574.3	7633395.1
Waramboo, 50.5k W of Pannawonica	Collector Unknown, WAM Record	344575.0	7632840.1

[2] Specimens recorded within the proposal area.
[3] Specimen recorded within Lease area (L45/147), outside of the proposal area.

3 RECORDED AND POTENTIAL SIGNIFICANT SPECIES

3.1 RECORDED SIGNIFICANT SPECIES

Significant species identified within the surveys of the Chichester Deviation Project area are listed in Table 3.1 and shown in Figure 3.1.

Table 3.1 – Recorded Significant Species

Species	Conservation Classification	Easting	Northing
Flora			
Goodenia nuda	Priority 3	705130 mE	7546312 mN
		708461 mE	7550082 mN
		703011 mE	7543186 mN
		705897 mE	7547299 mN
		707688 mE	7548843 mN
Fauna			
Western Pebble-mouse[4] (*Pseudomys chapmani)*	Priority 4 (DEC)	703270 mE	7541012 mN
		705352 mE	7541566 mN
		705440 mE	7541961 mN
		705655 mE	7546061 mN
		705714 mE	7542087 mN
		705783 mE	7541748 mN
		706092 mE	7547491 mN
		706095 mE	7547501 mN
		706149 mE	7547408 mN
		706319 mE	7547873 mN
		706328 mE	7547775 mN
		706346 mE	7548078 mN
		706354 mE	7547686 mN
		706435 mE	7548215 mN
		706513 mE	7547762 mN
		706640 mE	7548023 mN
		706676 mE	7547800 mN
		706733 mE	7547851 mN
		706798 mE	7548172 mN
		707048 mE	7548404 mN
		707405 mE	7548368 mN
Northern Short-tailed Mouse (*Leggadina lakedownensis)*	Priority 4 (DEC)	707309 mE	7552615 mN
		706232 mE	7556457 mN
Ghost Bat[5] (*Macroderma gigas)*	Priority 4 (DEC)	705004 mE	7546058 mN
Australian Bustard (*Ardeotis australis)*	Priority 4 (DEC)	706081 mE	7547413 mN
		705531 mE	7541814 mN
		702958 mE	7542253 mN

[4] Locations of active or recently active Western Pebble-mouse mounds recorded during baseline surveys (*ecologia*, 2008b).
[5] While the Ghost Bat (*Macroderma gigas)* was not physically observed within the proposal area, a call, believed to be that of the Ghost Bat, was recorded (*ecologia*, 2008b). No suitable roosts were identified within the Project area.

		703270 mE 702236 mE 707672 mE	7541012 mN 7541018 mN 7548386 mN
Western Star Finch (*Neochmia ruficauda)*	Priority 4 (DEC)	708665 mE	7549457 mN
Fork tailed Swift (*Apus pacificus)*	Migratory terrestrial species (EPBC)	706759 mE	7553619 mN
Rainbow Bee-eater (*Merops ornatus)*	Migratory terrestrial species (EPBC)	706081 mE 705004 mE 704673 mE 703270 mE 702958 mE 708218 mE 702542 mE	7547413 mN 7546058 mN 7544323 mN 7541012 mN 7542253 mN 7540498 mN 7542407 mN
Wood Sandpiper (*Tringa glareola)*	Migratory terrestrial species (EPBC)	708665 mE	7549457 mN

Figure 3.1 – Significant Species Recorded within the Project Area

(Sheet 1 of 2)

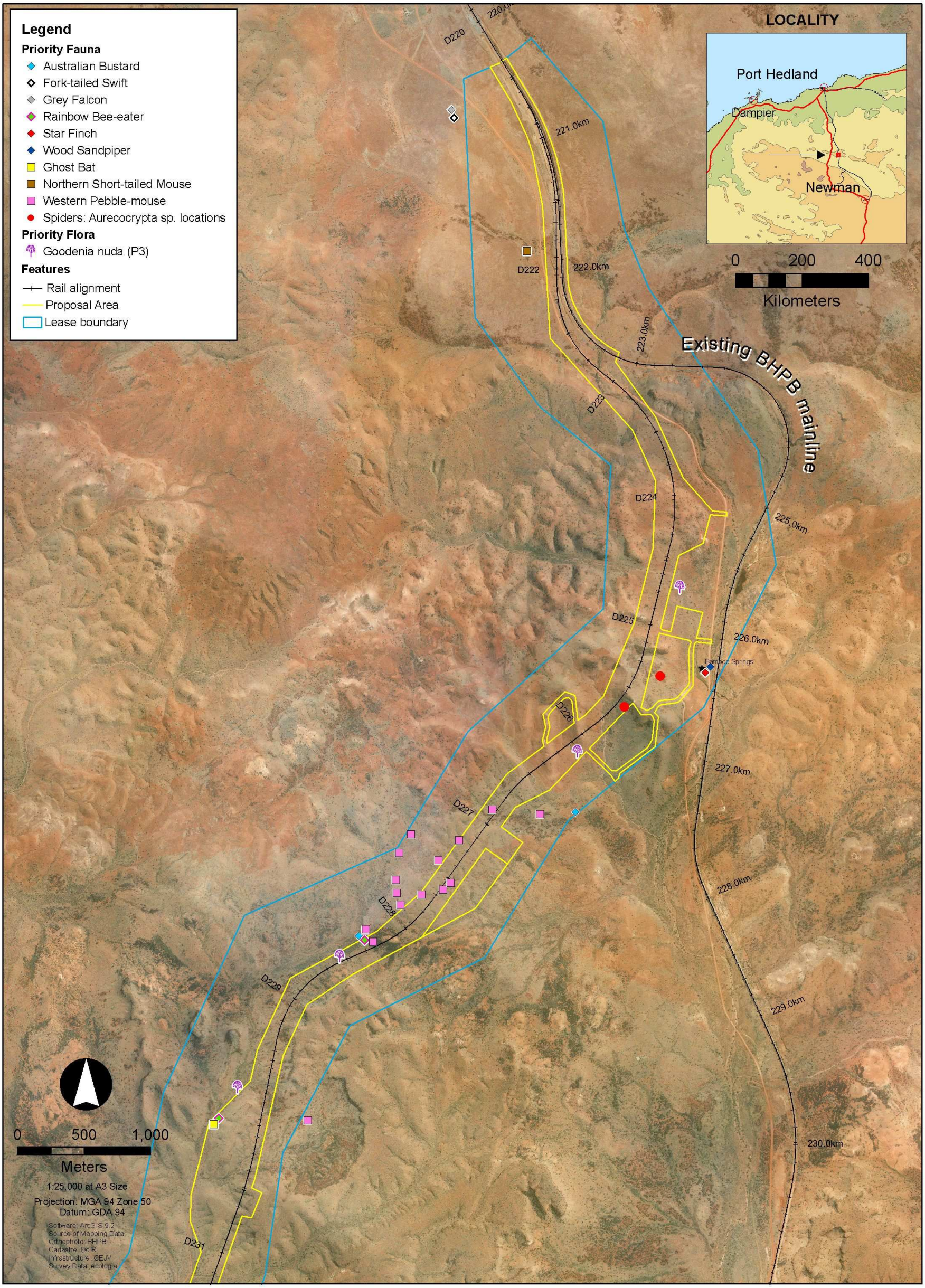
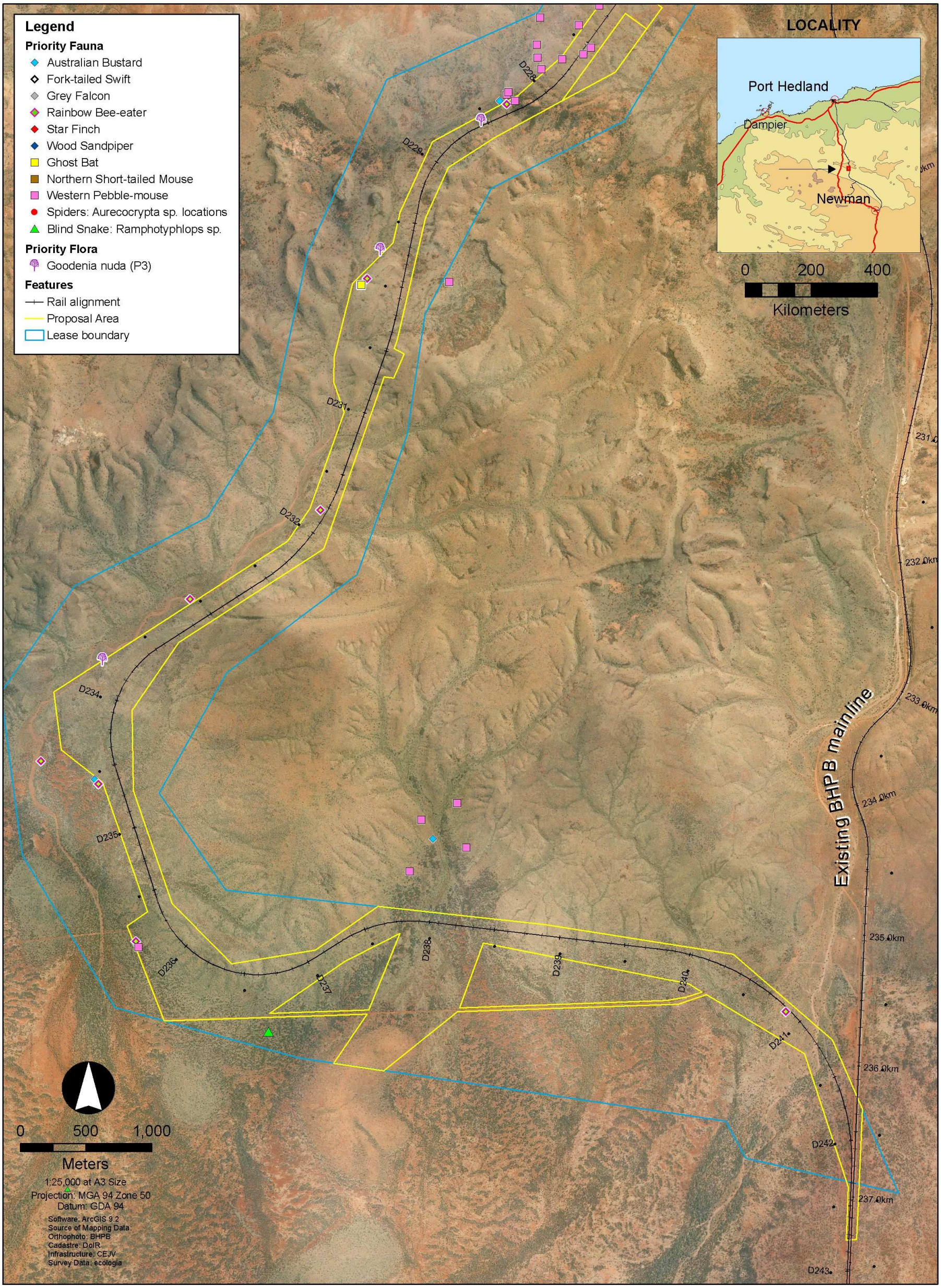


Figure 3.1 – Significant Species Recorded within the Project Area

(Sheet 2 of 2)



3.2 POTENTIAL SIGNIFICANT SPECIES

Based on habitats, known distribution, database searches and results of previous biological surveys in the surrounding areas, the following significant species have the potential to occur within the Chichester Deviation Project area (*ecologia*, 2008a & 2008b).

Table 3.2 – Conservation Significant Flora with the Potential to Occur within the Project Area

Scientific Name	Conservation Significance	Habitat
Lediduim catapycnon	Declared Rare (WC Act)	Stony hill slopes
Eremophila spongiocarpa	Priority 1 (DEC)	Weakly saline alluvial plain on margins of marsh, claypans
Goodenia sp. East Pilbara.	Priority 1 (DEC)	Red-brown clayey pan, swamp on major river floodplain
Gonocarpus ephemerus	Priority 2 (DEC)	Granite outcrop, red silty sand – clay, rocky outcrop, sandstone
Ischaemum albovillosum	Priority 2 (DEC)	Cracking clay, Gilgai
Gymnanthera cunninghamii	Priority 3 (DEC)	Brown red sand, major drainage, limestone rise, creekline, river sand
Hibiscus brachysiphoius	Priority 3 (DEC)	Red loam over basalt, hard setting red clay pan on limestone, Gilgai within clayey plain
Tephrosia sp. Cathedral Gorge	Priority 3 (DEC)	Stony hill slope, ridge crest, skeletal loam, gentle drainage depression
Triumfetta leptacantha	Priority 3 (DEC)	Red clay over boulder, red loam, fluviatile gravel, rocky breakaway, steep rock slopes, skeletal soils
Eremophila yougii supbp. *lepidota*	Priortiy 4 (DEC)	Stony red sandy loam. Flats plains, floodplains, sometimes semi-saline, clay flats

Table 3.3 – Conservation Significant Fauna with the Potential to Occur within the Project Area

Common Name	Scientific Name	Conservation Significance	Habitat	Potential to Occur in Project Area
Northern Quoll	*Dasyurus hallucatus*	Endangered (EPBC) Schedule 1 (DEC)	Rocky area, also eucalypt forest and woodland.	Recent records from Abydos plain and Quarry 4 and from Hamersley range to the south.
Greater Bilby	*Macrotis lagotis*	Vulnerable (EPBC) Schedule 1 (DEC)	Spinifex hummock grassland and acacia scrub. Has characteristic burrow systems.	Suitable habitat is present and there are nearby records of the species. No burrows observed within rail corridor.
Bush Stone-curlew	*Burhinus grallarius*	Priority 4 (DEC)	Lightly wooded country next to daytime shelter of thickets or long grass.	Recorded opportunistically approximately 6 km north of the project area. Suitable habitat adjacent to proposal area.
Grey Falcon	*Falco hypoleucos*	Priority 4 (DEC)	Coastal cliffs, riverine gorges and wooded watercourses.	Recorded at Repeater 5 (north of Project area).
Peregrine	*Falco peregrinus*	Priority 4 (DEC)	Coastal cliffs, riverine	Recorded just north of

Common Name	Scientific Name	Conservation Significance	Habitat	Potential to Occur in Project Area
Falcon			gorges and wooded watercourses.	study area and may use Project area for hunting.
Night Parrot	*Pezoporus occidentalis*	Endangered (EPBC) Schedule 1 (WC Act) Critically Endangered (DEC)	*Triodia* hummock grassland or chenopod shrublands. Thick unburnt vegetation most suitable.	Suitable habitat in some unburnt pockets of vegetation. Three individuals observed approximately 30 km from Project area.
A blind snake	*Ramphotyphlops ganei*	Priority 1 (DEC)	Unknown. Previous record found in clay/loam with Spinifex.	Recorded approximately 500 m south of Ch D237 during a previous survey (*ecologia*, 2005). Species is likely to still be resident in project area despite not being recorded during baseline surveys in 2008.
Pilbara Olive Python	*Liasis olivaceus barroni*	Vulnerable (EPBC) Schedule 1 (DEC)	Gorges and escarpments. Areas of permanent water.	Generally no suitable habitat for the species, except for permanent water and associated vegetation at Bamboo Springs.

With the exception of a *Ramphotyphlops ganei*, none of these significant species have been recorded within the Chichester Deviation Project area to date, however they are either known to occur in the wider area or suitable habitat exists within the Project area.

One individual of the *Ramphotyphlops ganei* was recorded approximately 500 m south of the rail alignment at Ch D237 during a previous survey within the Project area (*ecologia*, 2005). This species was not identified during baseline surveys of the Project area conducted in 2008.

4 GENERAL MANAGEMENT MEASURES FOR FLORA AND FAUNA

Management measures to minimise the potential impacts of the Chichester Deviation Project to all flora and fauna (i.e. not just significant species) can be broadly sub-divided into the following three categories:

- planning;
- construction; and
- operational and maintenance phases.

General management controls for each of these three phases are included in Table 4.1.

Table 4.1 – General Management Measures

Management Measure	Timing	Responsible Person
The rail formation and layout of associated infrastructure will be designed to minimise environmental impacts (including impacts on flora and fauna).	Planning	Project Manager
The results of baseline flora and fauna surveys will be assessed and the rail formation will be refined to minimise impacts on species of conservation significance.	Planning	Project Manager
The location of significant fauna and flora species, their habitat and significant vegetation types will be recorded on relevant environmental management databases and construction plans (where possible).	Planning / Construction	Site Environmental Officer
The area of land disturbance will be kept to a practicable minimum and rehabilitation will be conducted progressively where possible.	Construction	Construction Manager
Sensitive areas will be marked in the field using temporary flagging where possible, including an appropriately sized buffer.	Construction	Site Environmental Officer
BHPBIO's Site Environmental Officer (or nominated delegate) will retain records of areas that have been disturbed by construction activities, and where possible, record significant flora populations that have been impacted. A summary of areas of disturbance will be included in the Annual Environmental Report.	Construction	Site Environmental Officer
Night work will be avoided as far as practicable, however scheduling may require night works to occur. If night works are required, illumination of probable fauna habitat will be minimised where possible and contractors will be educated as to the potential locations and movements of nocturnal fauna species.	Construction	Construction Manager
Barbed wire fencing will not be used in the project area.	Construction / Operation	Construction Manager / Operations Manager
Weed management measures will be implemented in accordance with the Chichester Deviation Weed Management Plan (WMP).	Construction / Operation	Construction Manager/Operations Manager
The induction programme will be used to promote awareness of flora and fauna management measures (including significant species). The induction programme will include information on fauna interaction and appropriate waste management procedures.	Construction / Operation	Construction Manager/Operations Manager
Fauna injury or death within the Chichester Deviation Project area will reported to the Site Environmental Officer.	Construction	Project Manager
Reported fauna injury or death will be investigated to determine the cause of injury or death.	Construction	Site Environmental Officer

Management Measure	Timing	Responsible Person
Injured fauna species found within the Chichester Deviation Project area will be handled and transported in accordance with the procedures outlined in the BHPBIO Fauna Management Work Instruction (Appendix B).	Construction / Operation	Construction Manager/Operations Manager
BHPBIO 'Enviro Alert' information sheets for flora and fauna aspects of particular relevance to the Chichester Deviation Project site (e.g. management of particular significant species, weeds, or pests) will be prepared and distributed to increase awareness amongst employees and contractors as necessary.	Construction	Site Environmental Officer
Equipment and machinery movement		
Existing access tracks will be used where possible.	Construction / Operation	Construction Manager/Operations Manager
There will be no unauthorised off-road driving or other such recreational activities involving off-road vehicles.	Construction / Operation	Construction Manager/Operations Manager
Vehicle speed limits will be restricted to a maximum 80 km/h on access roads and construction haul roads.	Construction / Operation	Construction Manager/Operations Manager
Speed limits for driving activities will be subject to a risk assessment and will take into account a number of factors including the environment and safety.	Construction / Operation	Construction Manager/Operations Manager
Vehicles and machinery will be parked only in designated locations.	Construction / Operation	Construction Manager/Operations Manager
General Clearing		
Clearing will be conducted in accordance with the construction EMP including: A Project Environmental and Aboriginal Heritage Review (PEAHR) must be completed for review and sign off by BHPBIO representatives prior to commencement of clearing, to ensure compliance with legal and environmental requirements.	Construction / Operation	Construction Manager/Operations Manager
BHPBIO's Site Environmental Officer (or nominated delegate) will include any operational flora and fauna management requirements in the PEAHR authorisation form for the relevant planned clearing area. These management requirements will be determined on a case by case basis and may include, but are not necessarily restricted to the following: • Demarcation and retention of particular mature trees which can reasonably be avoided and may provide ongoing habitat during operations. • Specific timing requirements or clearing methods to be used in order to minimise potential harm to fauna species (i.e. staged clearing to maximise the opportunity for mobile species to move to adjoining areas). • Requirements to salvage and temporarily stockpile particular vegetation types or habitat features (i.e. leafy material, stumps, logs, boulders) for use in rehabilitation programmes. • Specific management measures to minimise impacts of species of conservation significance that may occur within or near the planned clearing area (i.e. identification of a particular species, protocol for reporting, requirements to avoid/collect/record).	Construction / Operation	Site Environmental Officer / Environmental Manager
Clearance plans will be prepared prior to clearing taking place to identify the extent of the area authorised to be cleared. The area to be cleared will be identified on the ground (e.g. with pegs and/or flagging tape). The BHPBIO Site Environmental Officer (or nominated delegate) will check the ground markings and regularly monitor clearing operations to verify works are	Construction	Site Environmental Officer

Management Measure	Timing	Responsible Person
proceeding according to plan.		
A condition prohibiting unauthorised clearing will be included in all contracts.	Construction	Project Manager
Blasting and Quarrying		
BHPBIO will conduct targeted pre-disturbance surveys of habitat identified as potentially containing significant fauna or flora. Disturbance of significant fauna and flora will be avoided where practicable.	Construction	Site Environmental Officer
Pits and Trenches		
Trenches and pits will be backfilled as soon as possible. Those trenches which remain open overnight will be fitted with egress ramps, to be placed at an angle no greater than 45 degrees.	Construction	Construction Manager
Daily inspections of open pits and trenches will be carried out prior to commencement of work to identify trapped or injured fauna.	Construction	Site Environmental Officer
Turkeys nests will be fenced to restrict access by fauna. Fauna escape methods such as wire mesh will be fixed within turkeys nests to allow fauna egress. Egress ramps will be placed at an angle no greater than 45 degrees.	Construction	Construction Manager
Bores will be capped and locked to prevent fauna entry.	Construction	Construction Manager

5 SPECIFIC MANAGEMENT MEASURES FOR SPECIES OF CONSERVATION SIGNIFICANCE

Information included in each of the following species profiles has been sourced from FaunaBase (Western Australian Museum 2008), Florabase (Western Australian Herbarium 2008), Hussey et al. (1997), *ecologia* Environment (2008a, 2008b, 2008c) and BHPBIO (2006a, 2006b and 2008b).

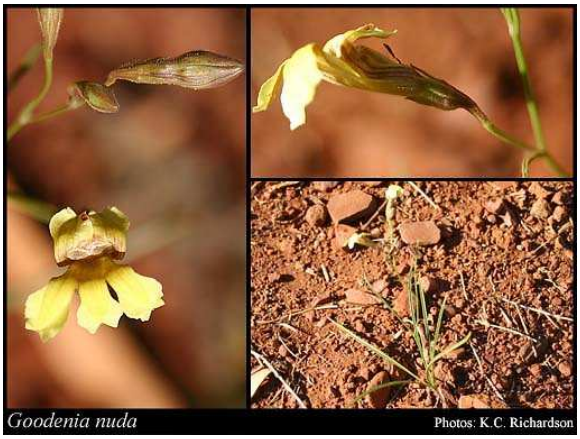
5.1.1 *Goodenia nuda*

Goodenia nuda

Description: Erect to ascending annual herb. Grows to 0.5m tall and produces yellow flowers from April – August.

Habitat: Dry scoured river beds, Spinifex grassland or mulga scrub.

Status: Priorty 3 (DEC) – Poorly known taxa. Taxa which are known from several populations, at least some of which are not believed to be under immediate threat.



(Image Source: WA Herbarium 2008)

Known Locations within the Project area

- Refer to Figure 3.1. Three known populations within the Project footprint.

General Management Measures

- Implement management measures described in Section 4 of this SSMP.

Specific Management Measures

- The Site Environmental Officer will review the results of baseline surveys to determine where *Goodenia nuda* has been recorded and ensure clearance plans are modified, where possible, to minimise or avoid impacts on *Goodenia nuda.*
- During clearing/construction in the area surrounding known locations of *Goodenia nuda*, the BHPBIO Site Environmental Office (or nominated delegate) will:
    - Work alongside operations personnel to assist in minimising impact on *Goodenia nuda* during clearing/construction operations.
    - Clearly demarcate identified populations of *Goodenia nuda* located in the vicinity of disturbance areas.
    - Maintain appropriate records of impacted populations.

Further Information: BHPBIO Site Environmental Officer.

Further Reading: WA Herbarium (2008) *Florabase* – http://florabase.calm.wa.gov.au

5.1.2 Ghost Bat (*Macroderma gigas*)

Ghost Bat

(*Macroderma gigas*)

Description: Light to dark grey upper body and paler below. Long ears joined together, large eyes, simple noselead and no tail. Largest micro-chiropteran bat in Australia.

Habitat: Rests in large caves, mines or deep rock fixtures.

Feeding: Australia's only carnivorous bat. A predator on large insects, frogs, lizards, birds, small mammals and even other bats (including bentwinged, horseshoe, leafnosed, heathtailed, and the little cave bat).

Status: Priority 4 (DEC) - 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 if present circumstances change. These taxa are usually represented on conservation lands.

Known Locations within the Project area

- No suitable roost sites have been identified, however, Ghost Bats may forage within the Project area. A ghost bat call was recorded at Ch D230km during baseline fauna surveys.

General Management Measures

- Implement management measures described in Section 4 of this SSMP.

Specific Management Measures

- The Site Environmental Officer (or nominated delegate) will conduct periodic visual inspections of potential habitat areas for the Ghost Bat.
- If bats are encountered, the Site Environmental Officer (or nominated delegate) will consult the DEC and engage a bat specialist, if required, to identify bat species.
- Maintain appropriate records of impacted populations.

Relocation Potential

- Not suitable for relocation

Further Information: BHPBIO Site Environmental Officer.

Further Reading: WA Museum (2008) *Faunabase* – http://www.museum.wa.gov.au/faunabase

5.1.3 Western Pebble-mouse (*Pseudomys chapmani*)

Western Pebble-mouse

(*Pseudomys chapmani*)

Description: Blackish-brown head, buff brown back and sides and a buff/white underbody. Grows to 135mm long (including 75mm tail).

Habitat: Rocky, hummock grasslands, with little or no soil. Occupies burrows under mounds of pebbles collected from nearby.

Feeding: Grasses and seeds.

Status: Priority 4 (DEC) - 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 if present circumstances change. These taxa are usually represented on conservation lands.

Known Locations within the Project area

- 20 active or recently active Pebble-mouse mounds have been identified throughout the Lease area. Seven of these mounds were recorded within the Project area. The majority of identified mounds are located north of Ch D228.5km. Refer to Figure 3.1.

General Management Measures

- Implement management measures described in Section 4 of this SSMP.

Specific Management Measures

- The rail formation design will be refined to minimise or avoid impacts to areas which are known locations of the Western Pebble-mound mouse.
- During clearing and construction near known locations of Western Pebble-mouse mounds, the Site Environmental Officer (or nominated delegate) will:
    - Work alongside operations personnel to assist in minimising impacts on the Western Pebble-mouse and its mounds during clearing/construction operations.
    - Clearly demarcate areas which contain populations of Western Pebble-mouse in the vicinity of disturbance areas.
    - Maintain appropriate records of impacted populations.
- The Site Environmental Officer (or nominated delegate) will conduct periodic visual inspections of potential habitat areas for the Western Pebble-mouse.
- Maintain appropriate records of impacted populations.

Relocation Potential

- Not noted to relocate well. Relocation is not recommended.

Further Information: BHPBIO Site Environmental Officer.

Further Reading: WA Museum (2008) *Faunabase* – http://www.museum.wa.gov.au/faunabase

5.1.4 Northern short-tailed mouse (*Leggadina lakedownensis)*

Northern short-tailed mouse

(*Leggadina lakedownensis)*

Description: 60 to 75 mm body and 40 to 45 mm tail. Grey colour.

Habitat: Open grassland with pockets of savannah woodland.

Feeding: Native and introduced grass seeds.

Status: Priority 4 (DEC) - 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 if present circumstances change. These taxa are usually represented on conservation lands.

Known Locations within the Project area

- Recorded to the north of the Chichester Range, outside the Project area, near sites of cracking clays. Refer to Figure 3.1.

General Management Measures

- Implement management measures described in Section 4 of this SSMP.

Specific Management Measures

- Minimise disturbance to areas of cracking clays.
- The Site Environmental Officer (or nominated delegate) will conduct periodic visual inspections of potential habitat areas for the Northern Short-tailed Mouse.
- Maintain appropriate records of impacted populations.

Further Information: BHPBIO Site Environmental Officer.

Further Reading: WA Museum (2008) *Faunabase* – http://www.museum.wa.gov.au/faunabase

5.1.5 Northern Quoll (*Dasyurus hallucatus*)

Northern Quoll

(*Dasyurus hallucatus*)

Description: Grey-brown to brown above with large white spots, cream to white below. The head and body is 123 to 310 mm long and the tail is 127 to 308mm long.

Habitat: Broken, rocky country and in open eucalyptus forest within 150km of the coast.

Feeding: Small mammals, reptiles, worms, insects and soft fruits.

Status: Endangered (EPBC Act) – The species is likely to become extinct unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate; or its numbers have been reduced to such a critical level, or its habitats have been so drastically reduced, that it is in immediate danger of extinction.

Known Locations within the Project area:

- Not recorded within Project area.

General Management Measures

- Implement management measures described in Section 4 of this SSMP.

Specific Management Measures

- Minimise activities in the vicinity of surface water bodies (e.g. Bamboo Springs).
- The Site Environmental Officer (or nominated delegate) will maintain appropriate records of possible sightings of Northern Quolls including location, date and time.

Further Information: BHPBIO Site Environmental Officer.

Further Reading: WA Museum (2008) *Faunabase* – http://www.museum.wa.gov.au/faunabase

5.1.6 Greater Bilby (*Macrotis lagotis*)

Greater Bilby

(*Macrotis lagotis*)

Description: Tail black on proximal half, then changes abruptly to white. Prominent dorsal crest and extreme tip of tail naked. Muzzle long and pointed, and has long ears to back of head. Hindfoot lacks first toe. Light and delicate in build, with soft and silky hair. Approximate body size is 300 to 500 mm (males) and 290 to 390 mm (females).

Habitat: Desert environmental, with habitat ranging from clayey and stony downs soils with sparse ground cover to massive red earths with Acacia shrubland.

Feeding: Derives water from food. Diet of larvae, seeds, bulbs, fruit and fungi.

Status: Schedule 1 (WC Act) – fauna which is Rare or likely to become extinct.

Vulnerable (EPBC Act) – Within the next 25 years, the species is likely to become endangered unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate.

Known Locations within the Project area:

- Not recorded within the Project area.

General Management Measures

- Implement management measures described in Section 4 of this SSMP.

Specific Management Measures

- Minimise activities in the vicinity of surface water bodies (e.g. Bamboo Springs).
- The Site Environmental Officer (or nominated delegate) will maintain appropriate records of possible sightings of Greater Bilbies including location, date and time.

Further Information: BHPBIO Site Environmental Officer.

Further Reading: WA Museum (2008) *Faunabase* – http://www.museum.wa.gov.au/faunabase

5.1.7 Pilbara Olive Python (*Morelia olivacea barroni*)

Pilbara Olive Python

(*Morelia olivacea barroni*)

Description: Dark olive, yellowish brown to olive brown with pearly sheet. The ventral surfaces white to cream. Grow to 4.5 to 6.5 m in length.

Habitat: Rocky areas along watercourses including escarpments and gorges.

Feeding: Small animals up to the size of rock wallabies.

Status: Schedule 1 (WC Act) – fauna which is Rare or likely to become extinct.

Vulnerable (EPBC Act) – Within the next 25 years, the species is likely to become endangered unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate.

Known Locations within the Project area:

- Not recorded in the region.
- Limited suitable habitat exists in the Project area.

General Management Measures

- Implement management measures described in Section 4 of this SSMP.

Specific Management Measures

- Minimise activities in the vicinity of surface water bodies (e.g. Bamboo Springs).
- The Site Environmental Officer (or nominated delegate) will maintain appropriate records of possible sightings of Pilbara Olive Pythons including location, date and time.

Relocation Potential

- In the event that a Pilbara Olive Python is found within or near an existing or planned disturbance area, and may reasonably be expected to be harmed if left in that location, the Site Environmental Officer (or nominated representative) will arrange for the individual to be captured and moved to a nearby protected area with similar habitat. All capture and relocation activities will be conducted by a person qualified in snake handling and in accordance with the procedures outlined in the BHPBIO Snake Relocation Manual.

Further Information: BHPBIO Site Environmental Officer.

Further Reading: WA Museum (2008) *Faunabase* – http://www.museum.wa.gov.au/faunabase

5.1.8 Unnamed Blind Snake (*Ramphotyphlops ganei*)

Unnamed Blind Snake

(*Ramphotyphlops ganei*)

Description: Harmless, specialised burrowing snakes. Represented by a dark spot beneath head scales. Usually less than 50 cm in length and have well-developed anal glands.

Habitat: Moist gorges and gullies in arid environments.

Feeding: Feed on invertebrates.

Status: Priority 1 (DEC) – Taxa which are known from few specimens or sight records from one or a few localities, on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

Known Locations within the Project area:

- Previously recorded south of Ch D237. Refer to Figure 3.1

General Management Measures

- Implement management measures described in Section 4 of this SSMP.

Specific Management Measures

- Minimise activities in the vicinity of surface water bodies (e.g. Bamboo Springs).
- The Site Environmental Officer (or nominated delegate) will maintain appropriate records of possible sightings of Blind Snakes including location, date and time.

Relocation Potential

- In the event that a Blind Snake is found within or near an existing or planned disturbance area, and may reasonably be expected to be harmed if left in that location, the Site Environmental Officer (or nominated representative) will arrange for the individual to be captured and moved to a nearby protected area with similar habitat. All capture and relocation activities will be conducted by a person qualified in snake handling and in accordance with the procedures outlined in the BHPBIO Snake Relocation Manual.

Further Information: BHPBIO Site Environmental Officer.

Further Reading: WA Museum (2008) *Faunabase* – http://www.museum.wa.gov.au/faunabase

5.1.9 Rainbow Bee-eater (*Merops ornatus*)

Rainbow Bee-eater

(*Merops ornatus*)

Description: Light-green back with black tail. Black eye-stripe, edged blue and a black band on yellow throat. Grows to 23 to 28 cm.

Habitat: Open country, including sand dunes and banks.

Feeding: The majority of its diet consists of insects.

Status: Migratory Species (EPBC Act) – species listed in the Bonn Convention, Government of Australia and the Government of the Peoples Republic of China for the Protection of Migratory Birds and their Environment (CAMBA) and 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).

Known Locations within the Project area:

- Rainbow Bee-eaters were observed at seven locations within the Deviation corridor. Refer to Figure 3.1.
- Suitable habitat exists across most of Project area, particularly along major creeklines.

General Management Measures

- Implement management measures described in Section 4 of this SSMP.

Specific Management Measures

- Minimise disturbance to creek lines and river banks.
- The Site Environmental Officer (or nominated delegate) will inspect river banks and creek lines prior to disturbance to identify Rainbow Bee-eater breeding tunnels.
- If breeding tunnels are identified within the area of disturbance, the Site Environmental Officer (or nominated delegate) will liaise with the DEC to determine best practice management.
- The Site Environmental Officer (or nominated delegate) will maintain appropriate records of possible sightings of Rainbow Bee-eaters including location, date and time.

Relocation Potential

- Bird species are expected to disperse prior to disturbance. No relocation required.

Further Information: BHPBIO Site Environmental Officer.

Further Reading: WA Museum (2008) *Faunabase* – http://www.museum.wa.gov.au/faunabase

5.1.10 Australian Bustard (*Ardeotis australis*)

Australian Bustard

(*Ardeotis australis*)

Description: Back and wings are brown. Upper wing coverts black and white. Underparts white to grey. Legs and feet pale yellow to grey. The crown is black with white eyebrow. The neck is white with a black breast band. The females crown is brown and the breast band is less visible. There is also less black on wings.

Habitat: Tussock grassland, grassy woodland and low woodlands.

Feeding: Insects, small vertebrates, seeds and fruit.

Status: Priority 4 (DEC) - 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 if present circumstances change. These taxa are usually represented on conservation lands.

Known Locations within the Project area:

- This species is relatively common in the Chichester Deviation Project area with suitable habitat across much of the rail corridor. Refer to Figure 3.1.

General Management Measures

- Implement management measures described in Section 4 of this SSMP.

Specific Management Measures

- The Site Environmental Officer (or nominated delegate) will maintain appropriate records of possible sightings of Australian Bustards including location, date and time.

Relocation Potential

- Bird species are expected to disperse prior to disturbance. No relocation required.

Further Information: BHPBIO Site Environmental Officer.

Further Reading: WA Museum (2008) *Faunabase* – http://www.museum.wa.gov.au/faunabase

5.1.11 Bush Stone-curlew (*Burhinus grallarius*)

Bush Stone-curlew

(*Burhinus grallarius*)

Description: Medium black bill. Forehead buff, pale buff eyebrow. Large yellow eyes. Black eye-stripe through to neck. Black streaking on grey-brown upperparts; buff-white underparts. Whitish shoulder patch. Approximate size is 55cm. Sound a mournful, wailing 'wee-loo' usually at night. Fly in single pairs or loose flocks up to 100 individuals or more. Active at night. Sulking habits, rigid movements and freezes to escape notice.

Habitat: Require sparsely grassed, lightly timbered, open forests or woodland.

Feeding: Small vertebrates and invertebrates, as well as seeds and shoots.

Status: Priority 4 (DEC) - 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 if present circumstances change. These taxa are usually represented on conservation lands.

Known Locations within the Project area:

- Not identified within the Chichester Deviation Project area. Recorded approximately 6 km north of the Project area during nocturnal survey. Refer to Figure 3.1.

General Management Measures

- Implement management measures described in Section 4 of this SSMP.

Specific Management Measures

- The Site Environmental Officer (or nominated delegate) will maintain appropriate records of possible sightings of Bush Stone-curlew including location, date and time.

Relocation Potential

- Bird species are expected to disperse prior to disturbance. No relocation required.

Further Information: BHPBIO Site Environmental Officer.

Further Reading: WA Museum (2008) *Faunabase* – http://www.museum.wa.gov.au/faunabase

5.1.12 Star Finch (Western subspecies) (*Neochmia ruficauda subclarescens*)

Star Finch (Western subspecies)

(*Neochmia ruficauda subclarescens*)

Description: Males are red faced with dark olive above and yellow-olive below. They are crested, rump and flank with tail spotted white. Females are duller, greyer with red only in the fronts and cheeks. The chin has coarser spots ventrally. Approximate size is 10-12 cm. Juveniles are plainer with black bill. They have a penetrating 'sweet' sound.

Habitat: Tall grass by swamps.

Feeding: Seeds of a number of grasses and among watered suburban gardens.

Status: Priority 4 (DEC) - 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 if present circumstances change. These taxa are usually represented on conservation lands.

Known Locations within the Project area:

- Not recorded in Project Area, however recorded at Bamboo Springs.

General Management Measures

- Implement management measures described in Section 4 of this SSMP.

Specific Management Measures

- Minimise activities in the vicinity of surface water bodies (e.g. Bamboo Springs).
- The Site Environmental Officer (or nominated delegate) will maintain appropriate records of possible sightings of Star Finches including location, date and time.

Relocation Potential

- Bird species are expected to disperse prior to disturbance. No relocation required.

Further Information: BHPBIO Site Environmental Officer.

Further Reading: WA Museum (2008) *Faunabase* – http://www.museum.wa.gov.au/faunabase

5.1.13 Wood Sandpiper (*Tringa glareola*)

Wood Sandpiper

(*Tringa glareola*)

Description: Medium, straight, black bill. Narrow pale eyebrow to behind the eye. Pale underwing and brown black dark wings, spotted white. White rump and yellow-green legs.

Habitat: Adjacent to fresh water.

Feeding: -

Status: Migratory Species (EPBC Act) – species listed in the Bonn Convention, Government of Australia and the Government of the Peoples Republic of China for the Protection of Migratory Birds and their Environment (CAMBA) and 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).

Known Locations within the Project area:

- Not recorded in Project Area.
- Recorded at Bamboo Springs however is unlikely to be a resident.

General Management Measures

- Implement management measures described in Section 4 of this SSMP.

Specific Management Measures

- Minimise activities in the vicinity of surface water bodies (e.g. Bamboo Springs).
- The Site Environmental Officer (or nominated delegate) will maintain appropriate records of possible sightings of Wood Sandpipers including location, date and time.

Relocation Potential

- Bird species are expected to disperse prior to disturbance. No relocation required.

Further Information: BHPBIO Site Environmental Officer.

Further Reading: WA Museum (2008) *Faunabase* – http://www.museum.wa.gov.au/faunabase

5.1.14 Grey Falcon (*Falco hypoleucos*)

Grey Falcon

(*Falco hypoleucos)*

Description: Grey above with black streak under eye, black wing-tips. White below with fine dark streaks. Tail grey, faintly barred as are the wings. Females are 41 to 43 cm in size, males 33 to 36 cm. Sounding is chattering and clucking. Heavy shouldered, Peregrine-like in flight.

In the first year of life colour is darker with heavier streaks on underparts.

Habitat: Woodland and scrub types in arid zone.

Feeding: Preys on birds, mostly granivorous parrots, pigeons and mammals. It occasionally feeds on carrion, including dead lambs.

Status: Priority 4 (DEC) - 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 if present circumstances change. These taxa are usually represented on conservation lands.

Known Locations within the Project area:

- Not identified within the Project area.
- Recorded at Repeater 5 to the north of the Project area at Ch 220.

General Management Measures

- Implement management measures described in Section 4 of this SSMP.

Specific Management Measures

- The Site Environmental Officer (or nominated delegate) will maintain appropriate records of possible sightings of Grey Falcons including location, date and time.

Relocation Potential

- Bird species are expected to disperse prior to disturbance. No relocation required.

Further Information: BHPBIO Site Environmental Officer.

Further Reading: WA Museum (2008) *Faunabase* – http://www.museum.wa.gov.au/faunabase

5.1.15 Peregrine Falcon (*Falco peregrinus*)

Peregrine Falcon

(*Falco peregrinus*)

Description: Blue-grey upperparts and cream underparts with dark barring on belly. The head and cheeks are black. Male grows to 45 to 54 cm and the female to 52 to 56 cm.

Habitat: Most land types particularly rocky outcrops and cliffs.

Feeding: Small birds typically taken in the air.

Status: Priority 4 (DEC) - 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 if present circumstances change. These taxa are usually represented on conservation lands.

Known Locations within the Project area:

- No individuals recorded within the Project area.
- Little suitable breeding habitat within the Project area.
- Could use the Project area for hunting.

General Management Measures

- Implement management measures described in Section 4 of this SSMP.

Specific Management Measures

- The Site Environmental Officer (or nominated delegate) will maintain appropriate records of possible sightings of Peregrine Falcons including location, date and time.

Relocation Potential

- Bird species are expected to disperse prior to disturbance. No relocation required.

Further Information: BHPBIO Site Environmental Officer.

Further Reading: WA Museum (2008) *Faunabase* – http://www.museum.wa.gov.au/faunabase

5.1.16 Night Parrot (*Pezoporus occidentalis*)

Night Parrot

(*Pezoporus occidentalis*)

Description: Medium sized nocturnal parrot. Thick set and short tailed. Upper parts are a dull, yellowish green with mottled and barred black and dark brown. Underparts are yellowish; primaries brown. No red fronts. Approximately 23 cm in size.

Habitat: Inland plains, breakaways, samphire about salt lakes. In day, believed to hide in dense saltbush or Spinifex and emerges at dusk.

Photo not available

Feeding: -

Status: Schedule 1 (WC Act) - fauna that is rare or is likely to become extinct.

Vulnerable (EPBC Act) – within the next 25 years, the species is likely to become endangered unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate.

Known Locations within the Project area:

- No individuals recorded within the Project area.

General Management Measures

- The Site Environmental Officer (or nominated delegate) will maintain appropriate records of possible sightings of Night Parrots including location, date and time.

Specific Management Measures

- The Site Environmental Officer (or nominated delegate) will maintain appropriate records of possible sightings of Night Parrots including location, date and time.

Relocation Potential

- Bird species are expected to disperse prior to disturbance. No relocation required.

Further Information: BHPBIO Site Environmental Officer.

Further Reading: WA Museum (2008) *Faunabase* – http://www.museum.wa.gov.au/faunabase

6 MONITORING AND INSPECTIONS

6.1 OVERVIEW

Monitoring of significant flora and fauna species will consist of two main components:

- monitoring and audit of management controls; and
- monitoring of significant fauna death and injury during the Project.

6.2 MONITORING OF MANAGEMENT CONTROLS

BHPBIO will conduct internal compliance audits of the implementation of Project environmental management commitments during the construction phase, including:

- quarterly on-site audits of compliance with this management plan;
- audits of contractors environmental management; and
- weekly work area inspections and monitoring.

Non-conformances identified during inspections will be documented, addressed with appropriate corrective and preventive actions and rectified within an agreed time frame.

This SSMP and the management measures herein will be reviewed annually and amended if required.

6.3 MONITORING OF FAUNA DEATH OR INJURY

Incidents during the Project will be managed in accordance with BHPBIO's environmental event management procedures, including:

- reporting death or injury of significant fauna as an environmental event to the Site Environmental Officer;
- conducting an event investigation within 72 hours of the event occurring;
- implementing corrective and preventative actions appropriate to the nature and scale of the event, that reduce the probability of re-occurrence and include review and/or revision of the risk register, relevant procedures and documentation (including this plan);
- assessing the effectiveness of corrective and preventative actions, particularly for repeat occurrences; and
- reporting all deaths of significant species to the DEC.

In the event that a control measure appears not to be effective, it will be adjusted as necessary in consultation with the DEC This SSMP will be updated if necessary to reflect any significant changes to control measures.

7 REPORTING

Information regarding the Significant Species Management Plan will be provided in BHPBIO's annual environmental report for rail operations, reporting on the previous 12 month period.

8 REFERENCES

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Appendix A – Explanation of Conservation Codes Used in Western Australia

FLORA

Environment Protection and Biodiversity Conservation Act 1999

At a National level, flora and fauna are protected under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The Act contains a list of species that are considered Critically Endangered, Endangered, Vulnerable, Conservation Dependent, Extinct or Extinct in the Wild.

Table 8.1 – Definition of Categories Described under the EPBC Act

Conservation Category	Definition
Extinct	A species is extinct if there is no reasonable doubt that the last member of the species has died.
Extinct in the Wild	A species is categorised as extinct in the wild if it is only known to survive in cultivation, in captivity or as a naturalised population well outside its past range; or if it has not been recorded in its known/expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
Critically Endangered	The species is facing an extremely high risk of extinction in the wild in the immediate future.
Endangered	The species is likely to become extinct unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate; or its numbers have been reduced to such a critical level, or its habitats have been so drastically reduced, that it is in immediate danger of extinction.
Vulnerable	Within the next 25 years, the species is likely to become endangered unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate.
Conservation Dependent	The species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

Wildlife Conservation Act 1950

Rare Flora is also protected under the *Western Australian Wildlife Conservation (Rare Flora) Notice 2005* of the *Wildlife Conservation Act 1950*. The notice lists protected flora taxa that are extant and considered likely to become extinct or rare. Generally speaking, species of flora are considered as being of Declared Rare Flora (DRF) or Priority conservation status where their populations are restricted geographically or threatened by local processes. DEC maintains a list of all DRF and Priority Flora taxa within Western Australia (Atkins, 2003). Definitions of categories of DRF and Priority Flora are provided below. Priority Flora are either poorly known, believed to be uncommon, rare or under threat but have not been designated as DRF and thereby legally protected because the detailed survey work to justify this has not been carried out. Priority species are maintained on a "Reserve List" and assigned to one of four Priority categories (Atkins, 2003).

Table 8.2 – Definition of Declared Rare and Priority Flora Categories

Code	Definition
DRF	Declared Rare Flora – Extant Taxa. Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection.
P1: Priority One	Poorly Known Taxa. Taxa which are known from one or a few (generally <5) populations

Code	Definition
	which are under threat.
P2: Priority Two	Poorly Known Taxa. Taxa which are known from one or a few (generally <5) population, at least some of which are not believed to be under immediate threat.
P3: Priority Three	Poorly Known Taxa. Taxa which are known from several populations, at least some of which are not believed to be under immediate threat.
P4: Priority Four	Rare Taxa. Taxa which are considered to have been adequately surveyed and which whilst being rare, are not currently threatened by any identifiable factors.

(From Atkins, K.J., Declared Rare and Priority Flora List April 2003, Dept CALM)

FAUNA

Commonwealth EPBC Act

Schedule 1 of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* contains a list of species that are considered Critically Endangered, Endangered, Vulnerable, Extinct, Extinct in the wild and Conservation Dependent.

Table 8.3 – Explanation of Codes for Fauna under the Commonwealth EPBC Act

Conservation Category	Definition
Critically Endangered	The species is facing an extremely high risk of extinction in the wild in the immediate future.
Endangered	The species is likely to become extinct unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate; or its numbers have been reduced to such a critical level, or its habitats have been so drastically reduced, that it is in immediate danger of extinction.
Vulnerable	Within the next 25 years, the species is likely to become endangered unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate.
Extinct	A species is presumed extinct if it has not been located in the last 50 years, or it has not been located in the last 10 years despite thorough searching.
Extinct in the Wild	The species is only known to survive in cultivation, in captivity or as a naturalised population well outside its past range or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a timeframe appropriate to its life cycle and form.
Conservation Dependent	The species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

WA Wildlife Conservation Act 1950 (Specially Protected Fauna) Notice

Classification of rare and endangered fauna under the WA *Wildlife Conservation (Specially Protected Fauna) Notice 2005*, recognises four distinct schedules.

Table 8.4 – Explanation of Codes under the WA *Wildlife Conservation Act 1950 (Specially Protected Fauna) Notice*

Code	Definition
Schedule 1	"fauna which are Rare or likely to become extinct, are declared to be fauna that is in need of special protection"
Schedule 2	"fauna which are presumed to be extinct, are declared to be fauna that is in need of special protection"
Schedule 3	"birds which are subject to an agreement between the governments of

	Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is in need of special protection"
Schedule 4	"declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in paragraphs (a), (b) and (c)."

DEC Priority Fauna

Species on the DEC Priority Fauna list include those removed from the Scheduled fauna list and other species known from only a few populations or in need of monitoring. Four Priority Codes are recognised.

Explanation of DEC Priority Fauna Categories

Priority Category	Definition
Priority One Taxa with few, poorly known populations on threatened lands.	Taxa which are known from few specimens or sight records from one or a few localities, on lands not managed for conservation, *e.g.* agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
Priority Two Taxa with few, poorly known populations on conservation lands.	Taxa which are known from few specimens or sight records from one or a few localities, on lands not under immediate threat of habitat destruction or degradation, *e.g.* national parks, conservation parks, nature reserves, State forest, vacant crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
Priority Three Taxa with several, poorly known populations, some on conservation lands.	Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
Priority Four 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 if present circumstances change. These taxa are usually represented on conservation lands.
Priority Five Taxa in need of monitoring	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 Redbook

Table 8.5 – Explanation of IUCN Fauna Categories

Category	Definition
Extinct (EX)	A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
Extinct in the Wild (EW)	A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
Critically Endangered (CR)	A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section

Category	Definition
	V), and it is therefore considered to be facing an extremely high risk of extinction in the wild.
Endangered (EN)	A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V), and it is therefore considered to be facing a very high risk of extinction in the wild.
Vulnerable (VU)	A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V), and it is therefore considered to be facing a high risk of extinction in the wild.
Near Threatened (NT)	A taxon is Near Threatened when it has been evaluated against the criteria, 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 near future.
Least Concern (LC)	A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.
Data Deficient (DD)	A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.
Not Evaluated (NE)	A taxon is Not Evaluated when it is has not yet been evaluated against the criteria.

IUCN categories are further classified based on the following criteria:

Critically Endangered (CR)

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing an extremely high risk of extinction in the wild:

A. Reduction in population size based on any of the following:

1. An observed, estimated, inferred or suspected population size reduction of 90% over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:

    a. direct observation;
    b. an index of abundance appropriate to the taxon;
    c. a decline in area of occupancy, extent of occurrence and/or quality of habitat;
    d. actual or potential levels of exploitation; and
    e. the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

2. An observed, estimated, inferred or suspected population size reduction of 80% over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of a-e under A1.

3. A population size reduction of 80%, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of b-e under A1.

4. An observed, estimated, inferred, projected or suspected population size reduction of 80% over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of a-e under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 100 km², and estimates indicating at least two of a-c:

   a. Severely fragmented or known to exist at only a single location.

   b. Continuing decline, observed, inferred or projected, in any of the following:
      (i) extent of occurrence;
      (ii) area of occupancy;
      (iii) area, extent and/or quality of habitat;
      (iv) number of locations or subpopulations; and
      (v) number of mature individuals.

   c. Extreme fluctuations in any of the following:
      (i) extent of occurrence;
      (ii) area of occupancy;
      (iii) number of locations or subpopulations; and
      (iv) number of mature individuals.

2. Area of occupancy estimated to be less than 10 km², and estimates indicating at least two of a-c:

   a. Severely fragmented or known to exist at only a single location.

   b. Continuing decline, observed, inferred or projected, in any of the following:
      (i) extent of occurrence;
      (ii) area of occupancy;
      (iii) area, extent and/or quality of habitat;
      (iv) number of locations or subpopulations; and
      (v) number of mature individuals.

   c. Extreme fluctuations in any of the following:
      (i) extent of occurrence
      (ii) area of occupancy
      (iii) number of locations or subpopulations
      (iv) number of mature individuals.

C. Population size estimated to number fewer than 250 mature individuals and either:

1. An estimated continuing decline of at least 25% within three years or one generation, whichever is longer, (up to a maximum of 100 years in the future) OR

2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):

    a. Population structure in the form of one of the following:
        (i) no subpopulation estimated to contain more than 50 mature individuals, OR
        (ii) at least 90% of mature individuals in one subpopulation.

    b. Extreme fluctuations in number of mature individuals.

D. Population size estimated to number fewer than 50 mature individuals.

E. Quantitative analysis showing the probability of extinction in the wild is at least 50% within 10 years or three generations, whichever is the longer (up to a maximum of 100 years).

Endangered (EN)

A taxon is Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a very high risk of extinction in the wild:

A. Reduction in population size based on any of the following:

1. An observed, estimated, inferred or suspected population size reduction of 70% over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
   a. direct observation;
   b. an index of abundance appropriate to the taxon;
   c. a decline in area of occupancy, extent of occurrence and/or quality of habitat;
   d. actual or potential levels of exploitation; and
   e. the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

2. An observed, estimated, inferred or suspected population size reduction of 50% over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of a-e under A1.

3. A population size reduction of 50%, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of b-e under A1.

4. An observed, estimated, inferred, projected or suspected population size reduction of 50% over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of a-e under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 5000 km², and estimates indicating at least two of a-c:

   a. Severely fragmented or known to exist at no more than five locations.

   b. Continuing decline, observed, inferred or projected, in any of the following:
      (i) extent of occurrence;
      (ii) area of occupancy;
      (iii) area, extent and/or quality of habitat;
      (iv) number of locations or subpopulations; and
      (v) number of mature individuals.

   c. Extreme fluctuations in any of the following:
      (i) extent of occurrence;
      (ii) area of occupancy;

(iii) number of locations or subpopulations; and
(iv) number of mature individuals.

2. Area of occupancy estimated to be less than 500 km², and estimates indicating at least two of a-c:

   a. Severely fragmented or known to exist at no more than five locations.

   b. Continuing decline, observed, inferred or projected, in any of the following:
      (i) extent of occurrence;
      (ii) area of occupancy;
      (iii) area, extent and/or quality of habitat;
      (iv) number of locations or subpopulations; and
      (v) number of mature individuals.

   c. Extreme fluctuations in any of the following:
      (i) extent of occurrence;
      (ii) area of occupancy;
      (iii) number of locations or subpopulations; and
      (iv) number of mature individuals.

C. Population size estimated to number fewer than 2500 mature individuals and either:

1. An estimated continuing decline of at least 20% within five years or two generations, whichever is longer, (up to a maximum of 100 years in the future) OR

2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):

   a. Population structure in the form of one of the following:
      (i) no subpopulation estimated to contain more than 250 mature individuals, OR
      (ii) at least 95% of mature individuals in one subpopulation.

   b. Extreme fluctuations in number of mature individuals.

D. Population size estimated to number fewer than 250 mature individuals.

E. Quantitative analysis showing the probability of extinction in the wild is at least 20% within 20 years or five generations, whichever is the longer (up to a maximum of 100 years).

Vulnerable (VU)

A taxon is Vulnerable when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a high risk of extinction in the wild:

A. Reduction in population size based on any of the following:

1. An observed, estimated, inferred or suspected population size reduction of 50% over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are: clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
   a. direct observation
   b. an index of abundance appropriate to the taxon
   c. a decline in area of occupancy, extent of occurrence and/or quality of habitat
   d. actual or potential levels of exploitation
   e. the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

2. An observed, estimated, inferred or suspected population size reduction of 30% over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of a-e under A1.

3. A population size reduction of 30%, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of b-e under A1.

4. An observed, estimated, inferred, projected or suspected population size reduction of 30% over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of a-e under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 20,000 km², and estimates indicating at least two of a-c:

   a. Severely fragmented or known to exist at no more than 10 locations.

   b. Continuing decline, observed, inferred or projected, in any of the following:
      (i) extent of occurrence;
      (ii) area of occupancy;
      (iii) area, extent and/or quality of habitat;
      (iv) number of locations or subpopulations; and
      (v) number of mature individuals.

   c. Extreme fluctuations in any of the following:
      (i) extent of occurrence
      (ii) area of occupancy

(iii) number of locations or subpopulations
(iv) number of mature individuals.

2. Area of occupancy estimated to be less than 2000 km², and estimates indicating at least two of a-c:

   a. Severely fragmented or known to exist at no more than 10 locations.

   b. Continuing decline, observed, inferred or projected, in any of the following:
      (i) extent of occurrence;
      (ii) area of occupancy;
      (iii) area, extent and/or quality of habitat;
      (iv) number of locations or subpopulations; and
      (v) number of mature individuals.

   c. Extreme fluctuations in any of the following:
      (i) extent of occurrence;
      (ii) area of occupancy;
      (iii) number of locations or subpopulations; and
      (iv) number of mature individuals.

C. Population size estimated to number fewer than 10,000 mature individuals and either:

1. An estimated continuing decline of at least 10% within 10 years or three generations, whichever is longer, (up to a maximum of 100 years in the future) OR

2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):

   a. Population structure in the form of one of the following:
      (i) no subpopulation estimated to contain more than 1000 mature individuals, OR
      (ii) all mature individuals are in one subpopulation.

   b. Extreme fluctuations in number of mature individuals.

D. Population is very small or restricted in the form of either of the following:

1. Population size estimated to number fewer than 1000 mature individuals.

2. Population with a very restricted area of occupancy (typically less than 20 km²) or number of locations (typically five or fewer) such that it is prone to the effects of human activities or stochastic events within a very short time period in an uncertain future, and is thus capable of becoming Critically Endangered or even Extinct in a very short time period.

E. Quantitative analysis showing the probability of extinction in the wild is at least 10% within 100 years.

Appendix B – BHPBIO Fauna Management Work Instruction

FAUNA MANAGEMENT

TABLE OF CONTENTS

AUTHORISATION

AUTHORISING OFFICER'S SIGNATURE ***Electronic Authorisation***
POSITION **AUTHORISED BY:** **MANAGER ENVIRONMENT AND SUSTAINABLE DEVELOPMENT**
AUTHOR(S)' NAME **MYCHELLE JOYCE**
POSITION/S Senior Environmental Advisor

AMENDMENTS

ISSUE	PAGE	DATE	DETAILS
1.0	All	19/03/07	Issued as new document

1.0 PURPOSE & SCOPE

To ensure that native fauna species are not adversely affected by construction, operations or decommissioning of work areas across BHPB Iron Ore sites.

This work instruction provides details on the safe handling and transportation of injured fauna and also deals with the capture and relocation of animals. A section on feral animal control is included. The document is not intended to describe monitoring programmes.
This document shall encompass Environmental Technicians in Newman & Port Hedland, or any other BHPB personnel or contractors engaged in undertaking fauna management.

2.0 REFERENCES

Legal, Standards & Other Requirements
Wildlife Conservation Act 1950
AS/NZS ISO14001:2004
BHP Billiton HSEC Management Standards

Related Documents
BHP Billiton Sustainable Development Policy
WIN-ENV-LAND NW-013 Snake Relocation
WIN-OPD-GEN-026 Procedure for the Rescue or Humane Dispatch of Fauna trapped in the Tailings Storage Facility
MAN-ENV-LAND NW-004 Fauna Management
MAN-ENV-FNA POP-001 Management of Feral Cats
WIN-IEN-LAND NW-001 Injured Cow Notification Procedure

ADP Specific
PP-09-099 Bulls

3.0 DEFINITIONS

Shall and should	the word “shall” is to be understood as mandatory and the word “should” as recommended but non-mandatory.
ADP	Asset Development Projects (construction)
Native Fauna	Animals that are native to Australia
Feral Animals	Foreign animals that are in Australia

4.0 ROLES AND RESPONSIBILITIES

All employees & contractors are responsible for the prevention of injury and harm to native fauna.

The Environmental section is responsible for supplying technical support to work groups who require it.

5.0 PROCEDURE

5.1 General Fauna Management Onsite

Minimal accidental or intentional impacts on native fauna shall be employed. This will include the prohibition of:

- Firearms on site (rail exempt);
- Off-road/ off-track use of vehicles;
- Pets on site (including taming of cats);
- Unnecessary disturbance of fauna habitat; and
- Fauna particularly native, being captured, fed, harmed or disturbed. If fauna relocation is required, the Environmental Representative shall be contacted.

In addition, the following management practices shall be employed during activities undertaken on any BHPBIO site:

- All bores will remain with locked caps in place, piping and conduit will be taped at ends- to prevent small creatures becoming trapped;
- Egress for fauna shall be made available by fixing rope, wire mesh or other materials in the corners of water storage facilities (e.g. turkeys nests), ensuring the egress materials are situated reaching the top of the water storage facility to the water surface at all times;
- Unless authorised, barbed wire is prohibited and will not be used in the work area, e.g. for fencing;
- All trenches, costeans, pits and bores shall be filled at the completion of use and ramped at the ends during works to ensure egress for fauna;
- In capturing animals, ensure that the appropriate PPE, including safety glasses and gloves, are worn (section 5.4 below).

5.2 Injured Native Fauna

For road kill advice see section 5.3 below.

Upon capturing an animal, or for assistance, the Environmental Representative must be immediately contacted, they will ask your name, location, type of fauna and injury sustained so appropriate capture equipment can be obtained.

Fauna shall be kept warm at all times once captured and will not be fed under any circumstances. A small dish of water may be placed with the animal.

All native fauna deaths shall be reported via an Event Notification. Feral animal sightings and deaths will be reported via Hazard Notification Form.

Birds

The size and type of bird being rescued can involve different tactics.

Small birds: Can be caught by hand (wearing gloves) or by placing a blanket over the animal before picking up. The bird can then be placed in a small box or cloth bag.

Large birds: When catching large birds, in particular raptors, the handler must wear long protective gloves. Cover with blankets being sure to secure the claws as they can pierce bone. Captured birds can be placed in a large box or plastic rubbish bin to be transported.

Reptiles

Snakes shall only be handled by persons that have completed a snake handling course and are recorded as a snake handler by the environmental section.

Small lizards: Can be caught by hand (wearing gloves) or by placing a blanket over the animal before picking up. They can then be placed in a cardboard box before relocating.

Large lizards: such as Bungarra's require a minimum of 3-4 people to safely capture the animal. First a lasso must be placed around the animals neck to secure the animal at a distance. Blankets should be placed over the animal and securing the tail is another method helpful in stopping the animal thrashing. While still holding the animal with the lasso and by the tail the animal can be placed in a cage for transporting.

5.3 Road Kills-Native Fauna

Road kills shall be removed at least 15m from the edge of the road and reported as an environmental event.

Kangaroos

- If an deceased kangaroo is found on the road, the animal shall be removed a minimum of 15m from the road edge to prevent predators becoming victims of on-coming traffic (e.g. Wedgetail eagles). Remove the animal with a shovel or similar.

- Injured kangaroos shall be humanely destroyed (e.g. though a blunt object like a tyre jack, or re-hitting the animal with the vehicle). Smaller Kangaroos that appear in reasonable condition (i.e. a broken leg) shall be covered and placed in the back of vehicles. Contact the nearest security gate or environmental officer for emergency contact numbers.
- Pouches must be checked live young. If present the joey should be taken out, wrapped in blanket (or similar) and the environmental coordinator contacted immediately.

Cattle

If a cow is hit by any form of mine vehicular traffic, the driver after coming to rest in a controlled manner and attending to any required medical aid, shall follow the process detailed below:

- The vehicle driver shall inspect the area of impact to locate the cow and assess the level of physical damage to the cow.

The following information shall be recorded:

- Approximate location of impact area;
- Cow ear tag colour and engraving (from a comfortable distance);
- Physical state of cow (i.e. Visible injury, unable to stand).

Immediately contact the Environmental Coordinator, or security if after hours. Refer to WIN-IEN-LAND NW-001 Injured Cow Notification Procedure for more detailed information and station contacts.

Procedure PP-09-099 Bulls, details information when working near and around cattle.

Cattle injuries or deaths are not reported as an environmental event.

5.4 Safety when Handling Fauna

A government permit is required to take and relocate any native animal. It is then essential that a Take 5 or JHA be completed before attempting to rescue or relocate any animal. The following are generic procedures that should be considered when assessing the task.

- Always do a Take 5 or JHA before attempting to rescue any animal;
- Ensure the appropriate PPE is worn during capture and handling, Gloves and Safety Glasses should be worn wherever there is a risk of injury;
- Ensure animals are kept securely contained during transport to prevent injury to themselves or others;

- Riggers gloves are to be worn when dealing with bats. Bats are not to be touched by hand;
- Wash hands thoroughly after any contact with animals.

5.5 Additional Information * Environment Office Use Only*

If the animal is a snake, follow the procedure detailed in WIN-ENV-LAND NW-013 (Snake Relocation). Should the call out be for any animal trapped in the Tailings Storage Facility (TFS) refer to WIN-OPD-GEN-026 Rescue or Humane Dispatch of Fauna Trapped in the Tailings Storage Facility. *Always contact the Emergency Services Department if safety is at risk or help is required.*

LOCATION	CARER	OPENING HOURS	CONTACT NUMBER 1	CONTACT NUMBER 2
Port Hedland	Vet	Business hrs & 24 hr Emergency	9172 1608	
Newman	Vet	Business hrs & 24 hr Emergency	9175 1309	
Pilbara	Pilbara wildlife Carers	Business hrs & reasonable after hrs	Kangaroos 0439984371 Birds* 0438924842 Reptiles 0418631656 Bats 0438924842	

Equipment Required / Location

Equipment	Location Newman	Location Port Hedland	Location ADP
Plastic rubbish bins	EW- seed storeroom	Environmental Shed	Wherever available - Speak to contractors
Large cages	EW- 2nd floor		
Small cages	EW- seed storeroom		
Lasso	EW- seed storeroom & ES		
Blankets	ES		
Rope	EW- seed storeroom, HSE9 & ES		
Harness	ES		
Recovery planks	Env. chemical shed	N/A	N/A

6.0 DOCUMENTATION

6.1 Records

- Native fauna deaths and injuries shall be recorded in the FPe database with all details pertaining to the event. These records will be kept for the life of operations.
- Records shall be maintained in accordance with the BHP Billiton Records Disposal Guidelines and Schedule.

6.2 Appendices

Nil