



SIGNIFICANT SPECIES MANAGEMENT PLAN

Atlas Iron Limited
Mt Webber DSO Project



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Mt Webber DSO Project

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1. INTRODUCTION

1.1 Project Overview

The Mt Webber DSO Project (the Project) is located approximately 150 km south-east of Port Hedland, in the Pilbara region of Western Australia (Figure 1).

The Project involves the development of a mining, processing, servicing and haulage operation to support Atlas's strategic production objective of producing 15 million tonnes per annum (Mtpa) of iron ore by 2015. Atlas proposes to extract ore from a proven and probable resource of 51.1 Million Tonnes (Mt) from three open pits at Mt Webber, over a mine life of approximately 10 years.

The Project is scheduled to progress in two stages, with construction of Stage 1 commencing in Quarter 1 2013 and production commencing in Quarter 3 2013. Targeted Stage 1 production is 3 Mtpa of iron ore fines product from two pits (Ibanez and Fender). Stage 2 is proposed to allow for the production of an additional 3 Mtpa of product, for a total output of 6 Mtpa from three pits (Ibanez, Fender and Dalton).

Atlas have committed to clearing no more than 756 hectares (ha) within the 1,064 ha application area in the development of the Project.

1.2 Purpose

The Project has the potential to affect a number of conservation significant species, which are protected under the *Environmental Protection and Biodiversity Act 1999* (EPBC Act) and *Wildlife Conservation Act 1950* (WA) (WC Act). There are up to 24 species of conservation significant terrestrial fauna that may potentially occur within the project area.

The purpose of this significant species management plan (SSMP) is to mitigate impacts to conservation significant fauna species and ensure that the Project is developed in an environmentally acceptable manner. This SSMP does not consider invertebrates (i.e. short-range endemic invertebrates or subterranean fauna).

The objectives of this SSMP are to:

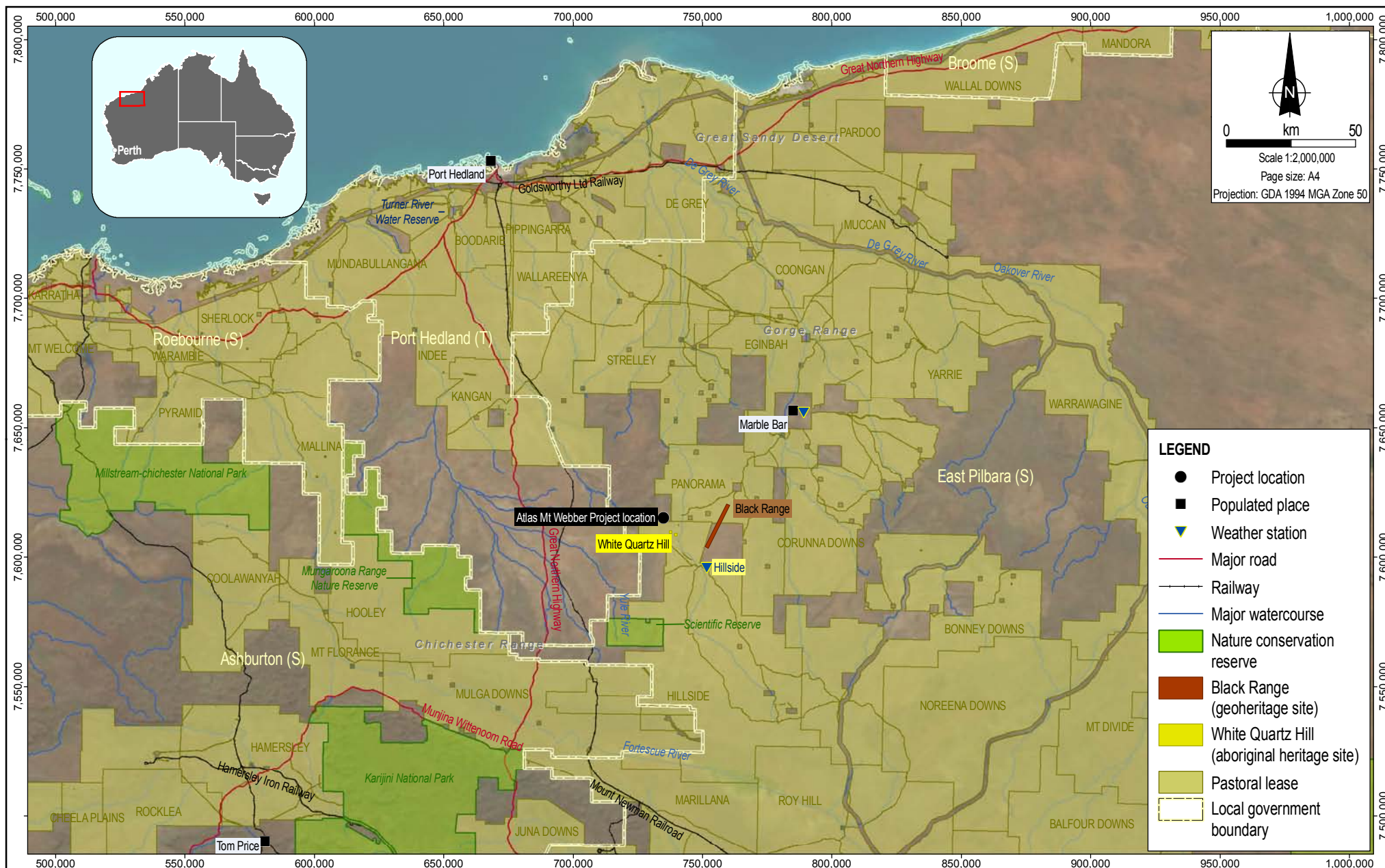
- Maintain an inventory of species of conservation significance that have the potential to be affected by the Project.
- Avoid or minimise impacts to conservation significant species and habitats.
- Monitor for potential impacts to conservation significant species.
- Detail the reporting requirements relating to conservation significant species.

1.3 Legislative Context

Environmental legislation relevant to this management plan includes the Commonwealth *Environment Protection and Biodiversity Act 1999* (EPBC Act) and the State *Environmental Protection Act 1986* (EP Act), *Wildlife Conservation Act 1950* (WC Act) and *Mining Act 1978*.

1.4.1 Commonwealth Legislation

The EPBC Act provides for the protection of matters of national environmental significance. Actions likely to cause significant impact to matters of national environmental significance need to



Source:
 WWTIP location from Atlas Iron. Weather stations from Bureau of Meteorology.
 Nature reserves, populated places, roads, railways and watercourses from
 Geoscience Australia GEODATA 250K (optimum scale 1:250,000).
 Pastoral leases from Landgate. Mining tenements and geoheritage site from DMP.
 Aboriginal heritage site from DIA. Local government boundaries from ABS.
 Aerial imagery from Bing Maps on ArcGIS Online.

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Locality plan and regional setting

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be assessed under the EPBC Act. The main authority under this Act is the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Nationally threatened species listed under the EPBC Act are considered to be matters of national environmental significance. Migratory species listed under international conventions and agreements that Australia is a party to, are also protected under the EPBC Act. Definitions of the various conservation categories for nationally threatened species and migratory species are provided in Appendix 1.

A number of threatened fauna species and migratory species are present or are likely to occur in the vicinity of the Project.

1.4.2 State Legislation

Environmental Protection Act 1986

The EP Act is the primary legislation that governs environmental impact assessment and protection in Western Australia. The aim of this Act is to prevent, control and abate environmental pollution for the conservation, preservation, protection, enhancement and management of the environment. Authorities under this Act include the Department of Environment and Conservation (DEC) and the Environmental Protection Authority (EPA).

Approvals can be required under two parts of the Act: Part IV, Environmental Impact Assessment; and Part V, Environmental Regulation. The criteria for referral/assessment under Part IV of the Act, as detailed within the Memorandum of Understanding (MoU) established between the Department of Mines and Petroleum (DMP) and the Environmental Protection Authority (EPA) are not triggered by this Project.

As the Project has not been referred to the EPA under Part IV of the Act, the Project requires a permit to clear in accordance with Part V of the Act. The clearing provisions of this Act are described in the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.

Wildlife Conservation Act 1950

The *Wildlife Conservation Act 1950* provides for the protection of native flora and fauna if they are under identifiable threat of extinction, are rare, or generally in need of protection. The main authority under this Act is the Department of Environment and Conservation.

Threatened fauna are listed in government gazettes as Specially Protected Fauna. Definitions of the various conservation categories are provided in Appendix 1.

1.5 Terminology and Definitions

1.5.1 Conservation Significance

For the purposes of this SSMP, conservation significant species are defined as species listed under Commonwealth or State legislation or listed as priority species by the DEC, or considered by qualified specialists to be locally important.

Commonwealth and State-listed species are discussed in Section 3 and related conservation category definitions are provided in Appendix 1. Species of concern (i.e. those species that are poorly known, uncommon, rare or otherwise threatened) that are not listed under legislation may be prioritised by the DEC. Their conservation significance is reviewed by the DEC on a regular basis. Definitions for priority fauna are provided in Appendix 1.

1.5.2 Likelihood of Occurrence

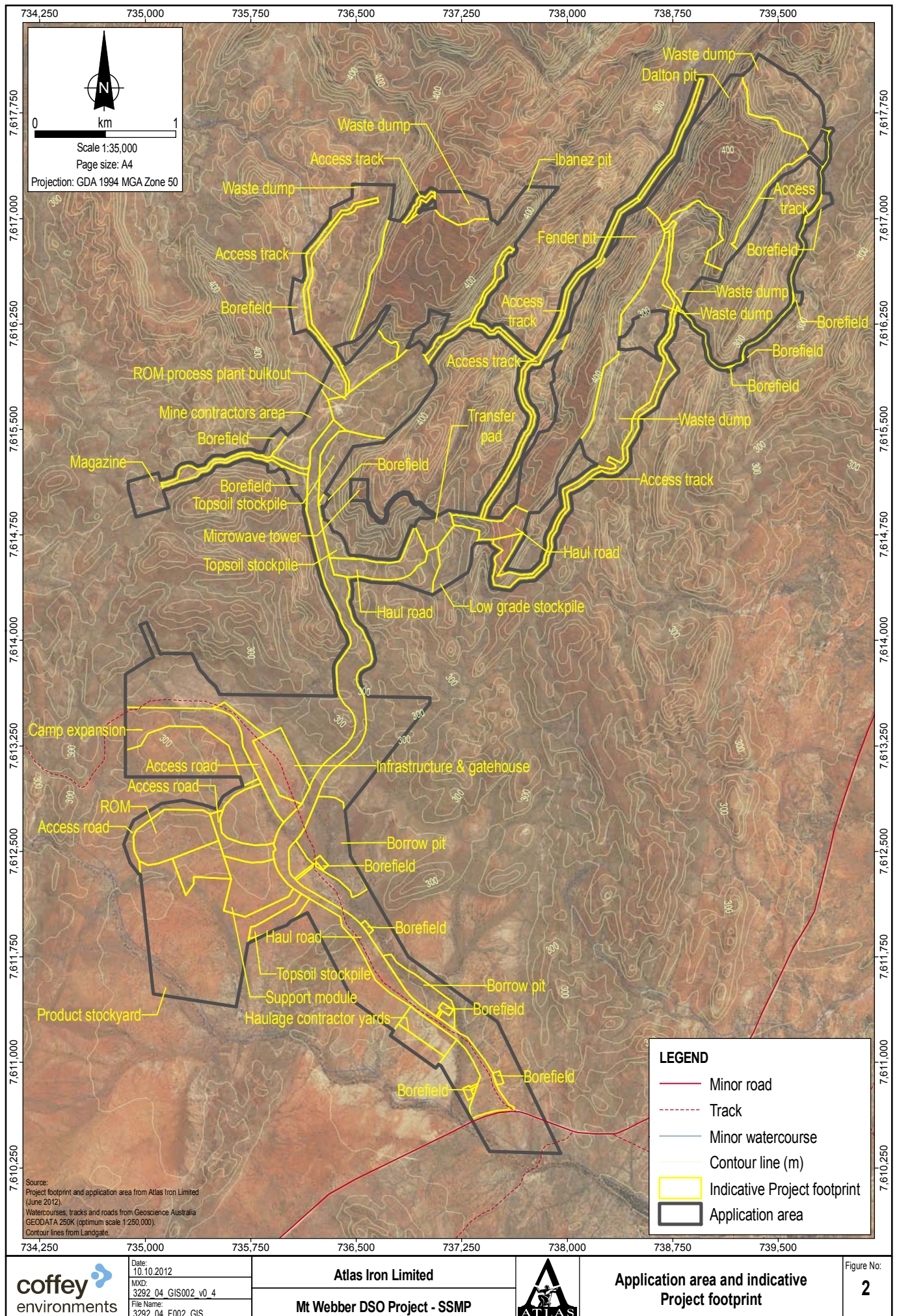
The following definitions of likelihood of occurrence are used in this SSMP:

- *Confirmed* – Species presence in the study area was recorded unambiguously during the survey.
- *Very Likely* – Study area lies within the species' known distribution and contains suitable habitat (s) and has been recorded nearby in the last 20 years.
- *Likely* – Study area lies within the species' known distribution and has been recorded nearby in the last 20 years; however, either:
 - (a) Study area contains marginally suitable habitat or only a small area of suitable habitat; or
 - (b) The species is generally rare and patchily distributed in suitable habitat.
- *Possible* – Outside chance of occurrence based on:
 - (a) Study area is just outside the known distribution; however, contains suitable and sufficient habitat (species may be common, rare, or patchy); or
 - (b) Study area lies within the known distribution but species is very rare and/or patchily distributed; or
 - (c) Study area lies on the edge or within the known distribution and has suitable habitat, but the species has not been recorded in the area for over 20 years.
- *Unlikely* – Study area lies outside the species known distribution, does not contain suitable habitat and the species has not been recorded in the area for over 20 years.

1.5.3 Project Terminology

Project terminology is as follows:

- The *Project* refers to the Mt Webber DSO Project.
- *Application area* refers to the 1,064 ha area within which Atlas intends to clear no more than 756 ha (Figure 2).
- *Project area* is defined as the area of ground disturbance.
- *Indicative Project footprint* (756 ha) is the area Project impacts were assessed on given the Project area has not been finalised at the time of assessment.
- *Survey area* is defined as the area over which the surveys have been conducted, as described in Chapter 3 and depicted in Figure 2.



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2. ROLES AND RESPONSIBILITIES

Atlas is committed to managing its activities in an environmentally and socially responsible manner, as reflected in Atlas's Environmental and Social Policy. This policy is based on the recognition that mining projects affect the environment. Through prudent planning and excellence in management, most significant impacts can be avoided or mitigated.

Atlas roles and responsibilities for the implementation of this SSMP are outlined in Table 1.

Table 1 Atlas roles and responsibilities for SSMP implementation

Role	Responsibility
Environmental Superintendent	<ul style="list-style-type: none">• Implement and maintain the SSMP.• Review the SSMP.
Site Environmental Advisor	<ul style="list-style-type: none">• Implement monitoring programs.• Maintain monitoring records.• Deliver monitoring data to the DSEWPac and DEC.• Implement and deliver education and awareness training program to personnel, contractors and visitors.• Record all sightings of or incidents involving conservation significant fauna.• Assess ground disturbance and access applications.• Ensure all personnel involved fauna surveys are licensed and/or qualified.
Construction and Operation managers	<ul style="list-style-type: none">• Monitor SSMP implementation by site personnel and contractors.• Participate in compliance audits and inspections.
All personnel, contractors and visitors	<ul style="list-style-type: none">• Undertake education and awareness training before commencing duties onsite.• Implement SSMP where relevant in daily activities.• Report all sightings of or incidents involving conservation significant fauna.

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3. FAUNA VALUES

This chapter provides an overview of the relevant baseline studies conducted and the existing fauna values associated with the Project.

Outback Ecology conducted a level 2 terrestrial fauna assessment for the Project in accordance with EPA guidance statement No 56 (EPA, 2004). The terrestrial fauna assessment drew upon the findings of a desktop study, reconnaissance survey (March 2010, March 2012) and a comprehensive, multi-season, Level 2 vertebrate fauna survey (April 2010, September – October 2010, March 2012). The aim of the survey was to identify and map habitat types, document fauna assemblages and identify species of conservation significance that occur or are likely to occur within the study area.

3.1 Habitats

Outback Ecology identified six broad fauna habitats within the application area as depicted in Figure 3 (Outback Ecology, 2012) and listed below:

- Rocky foothills.
- Rocky ridges and gorges.
- Stony rise.
- Spinifex stony plain.
- Drainage line.
- Upland drainage line.

Of the six broad fauna habitats, two were considered to be significant, namely Rocky ridges and gorges and Drainage line habitats. These two habitats were recognised as being significant as they were considered capable of supporting conservation significant species or distinct fauna assemblages (Outback Ecology, 2012). Outback Ecology also identified two significant habitat features – caves and cliff lines – which occur within the Rocky ridges and gorges habitat (see Figure 3).

Atlas have committed to clearing no more than 756 ha of habitat for the Project, within the 1,064 ha application area.

3.2 Conservation Significant Species

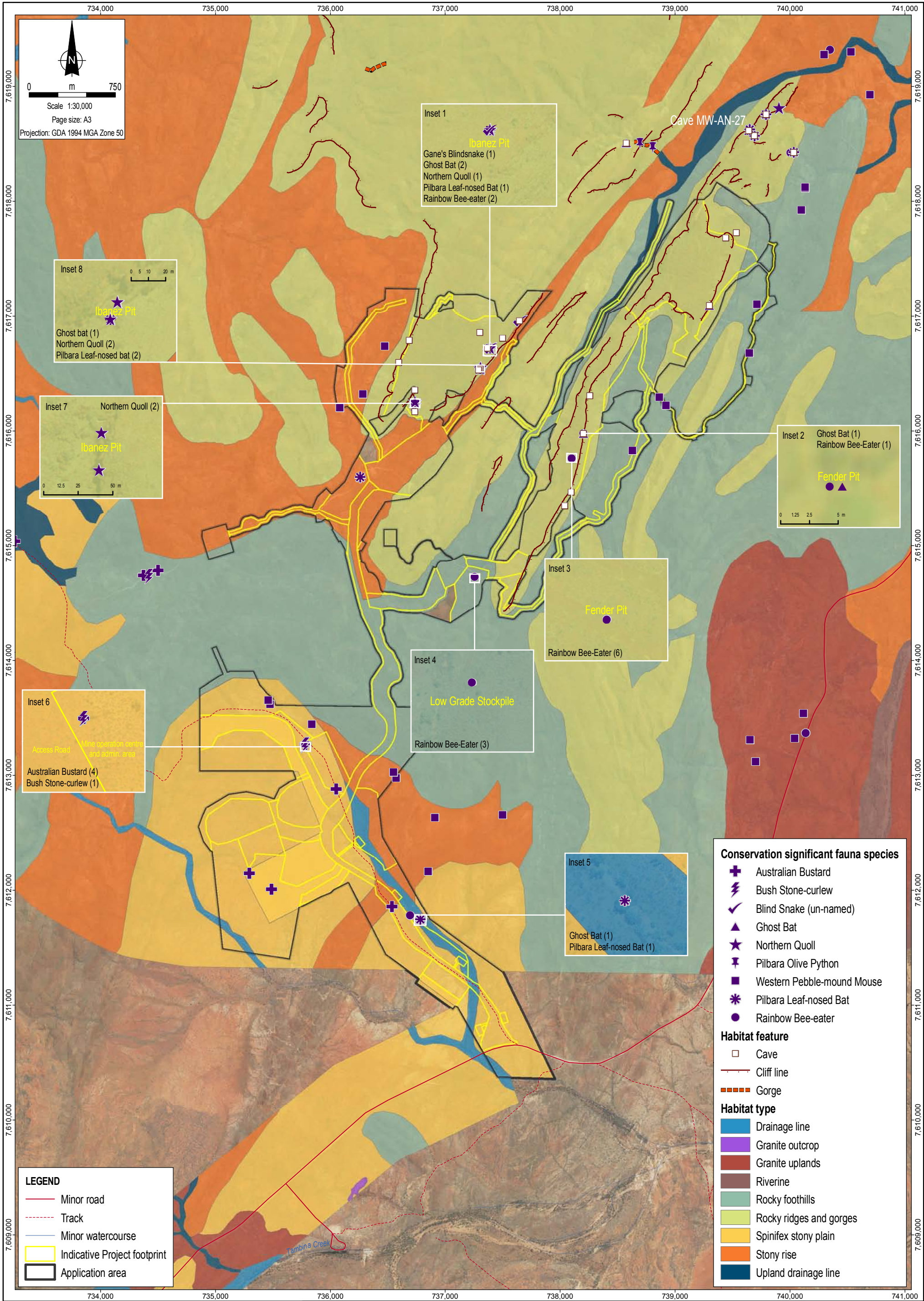
The level 2 survey recorded a total of 155 vertebrate species within the survey area including 22 mammals, 68 birds, 59 reptiles and six amphibians. Of these species, nine were of conservation significance (as shown in Figure 3). An additional 15 species of conservation significance were identified as having the potential to occur within the survey area during the desktop study (Outback Ecology, 2012). The likelihood of these 15 species occurring was assessed using the criteria defined in Section 1.5.2.

A list of the conservation significant species known to occur or potentially occurring in the survey area (along with their likelihood of occurrence) has been provided in Table 2.

Further information relating to each conservation significant species listed in Table 2 is provided in Appendix 2.

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Source:
Project footprint and application area from Atlas Iron Limited (June 2012).
Watercourses, tracks and roads from Geoscience Australia GEODATA 250K (optimum scale 1:250,000).
Fauna habitats and records from Outback Ecology (August 2012).

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Fauna habitats and conservation significant
fauna records within the application area

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Table 2 Conservation significant present or potentially occurring in the study area

Scientific Name	Common Name	Conservation Status		Likelihood of Occurrence
		EPBC Act	WC Act	
Mammals				
<i>Dasyurus hallucatus</i>	Northern Quoll	EN	S1	Confirmed
<i>Rhinonictis aurantia</i>	Pilbara Leaf-nosed Bat	VU	S1	Confirmed
<i>Dasycercus blythi</i>	Brush -tailed Mulgara	VU	P4	Very Likely
<i>Macrotis lagotis</i>	Greater Bilby	VU	S1	Possible
<i>Mormopterus loriae cobourgiana</i>	Mangrove Freetail-bat	–	P1	Unlikely
<i>Lagorchestes conspicillatus leichardti</i>	Mainland Spectacled Hare-wallaby	–	P3	Likely
<i>Macroderma gigas</i>	Ghost Bat	–	P4	Confirmed
<i>Pseudomys chapmani</i>	Western Pebble-mound Mouse	–	P4	Confirmed
<i>Leggadina lakedownensis</i>	Lakeland Downs Mouse	–	P4	Likely
Birds				
<i>Pezoporus occidentalis</i>	Night Parrot	EN	S1	Unlikely
<i>Falco peregrinus</i>	Peregrine Falcon	–	S4	Likely
<i>Ardeotis australis</i>	Australian Bustard	–	P4	Confirmed
<i>Burhinus grallarius</i>	Bush Stone-curlew	–	P4	Confirmed
<i>Falco hypoleucos</i>	Grey Falcon	–	P4	Possible
<i>Neochmia ruficauda subclaescens</i>	Western Star Finch	–	P4	Likely
<i>Numenius madagascariensis</i>	Eastern Curlew	–	P4	Unlikely
<i>Merops ornatus</i>	Rainbow Bee-eater	M	S3	Confirmed
<i>Apus pacificus</i>	Fork-tailed Swift	M	S3	Likely
<i>Charadrius veredus</i>	Oriental Plover	M	S3	Possible
<i>Ardea ibis</i>	Cattle Egret	M	S3	Possible
Reptiles				
<i>Liasis olivaceus barroni</i>	Pilbara Olive Python	VU	S1	Confirmed
<i>Ramphotyphlops ganeii</i>	Un-named Blind Snake	–	P1	Confirmed
<i>Ctenotus nigrilineatus</i>	Pin-striped Finesnout Ctenotus	–	P1	Possible
<i>Ctenotus uber johnstonii</i>	Spotted Ctenotus	–	P2	Possible

Source: Outback Ecology, 2012.

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4. POTENTIAL IMPACTS

Each stage of the Project (construction, operation and closure/rehabilitation) has the potential to affect the abundance, distribution and condition of conservation significant fauna within the Project area and surrounds. Potential impacts of the Project on terrestrial fauna of conservation significance are:

- Loss and/or degradation of fauna habitat, resulting in a direct loss of species, fragmentation effects and a reduction in the extent of breeding and foraging habitat.
- Injuries to and mortalities of terrestrial vertebrate fauna caused by interactions with vehicles, infrastructure, machinery and the workforce.
- Reduced diversity or abundance of foraging resources due to altered hydrological regimes.
- Alteration in behaviour of terrestrial vertebrate fauna due to dust, noise, vibration and light emissions.
- Increased presence of non-indigenous species due to introduction of workforce and vehicles, inappropriate waste collection and storage practices, and inadequate rehabilitation of disturbed land, resulting in terrestrial vertebrate fauna mortality and/or competition for resources.
- Alteration to fire regimes (e.g. increased frequency, intensity, extent) from the presence of human activity in the area, resulting in the modification or loss of fauna habitat and conservation significant terrestrial vertebrate fauna.
- Loss and/or degradation of terrestrial vertebrate fauna habitat due to increased presence of weed species.

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5. MANAGEMENT MEASURES

This chapter discusses the management measures in place to control and mitigate impacts to conservation significant fauna from the Project.

Management measures have been developed and grouped into two levels:

- **Standard Management.** A list of standard management measures developed and implemented to manage and mitigate impacts to all conservation significant terrestrial vertebrate fauna.
- **Species-specific Management.** A list of management measures developed and implemented for any conservation significant terrestrial vertebrate fauna species that have been confirmed as present in the Project area and are so are likely to be impacted by the Project.

Atlas' Environmental Superintendent will review the species managed as part of "species-specific management" (refer to Section 5.2) during the SSMP annual review. Should a conservation significant terrestrial vertebrate fauna species not previously confirmed as present within the Project area be identified within the Project area, the Atlas Environmental Superintendent will update the SSMP to include that species under "species-specific management".

Management measures have been numbered (i.e. FA01) to assist in ensuring consistency among the various approval documents and for auditing purposes (Note: numbering is not consecutive as it relates to Atlas' Project Environmental Management Register).

5.1 Standard Management

This section details the standard management measures relevant to all conservation significant terrestrial vertebrate fauna. These management measures have been developed in consideration of baseline studies (Section 3), identified potential Project impacts (Section 4), specialist advice and current industry practices.

The following management measures will be implemented:

- FA01** Clearing in/of sensitive habitats including caves, cliff lines, waterholes, gorges, ridges, outcrops, drainage lines, scree slopes and crevices will be kept to the minimum necessary for safe construction and operation of the Project.
- FA02** Night-time vehicle movements during construction will be restricted where possible to minimise the potential for vehicle strikes.
- FA03** Signage identifying the presence of conservation significant fauna will be installed along the roads, where they intersect suitable habitat.
- FA04** Borrow pits will be designed and constructed to permit egress of fauna.
- FA05** Turkey's nests will be constructed to ensure a point of ingress/egress to prevent fauna mortalities.
- FA06** The landfill will be operated and managed in accordance with the Environmental Protection (Rural Landfill) Regulations 2002, including fencing of the landfill to reduce the potential for attracting fauna.

- FA07** The Site Environmental Advisor will maintain a site database and maps detailing, the location of:
- Conservation significant species and habitat.
 - Impact exclusion zones.
 - Cleared areas.
 - Rehabilitated areas.
- FA08** Vehicle speed limits will be imposed and enforced on Project roads.
- FA09** Off- road driving will be prohibited unless otherwise authorised by senior management.
- FA10** Noise, dust and light emissions will be controlled to avoid excessive disturbance to native fauna, including directing lights to working areas, shielding lights to reduce glow, and using conventional dust suppression techniques (i.e. water trucks).
- FA11** All bins storing putrescible waste will have a tightly secured lid to avoid fauna attraction and entry.
- FA12** Education and awareness training will identify conservation significant fauna and habitat and discuss relevant management measures and personnel/contractor responsibilities, including incident reporting requirements (i.e. reporting of fauna observations and/or incidents).
- FA13** All fauna mortalities and injuries will be reported to the Site Environmental Advisor within 24 hours and recorded within Atlas's incident reporting system.
- FA14** The Site Environmental Advisor will report all conservation significant fauna injuries and mortalities to DEC within one week.
- FA15** Where required, fauna will be handled and transported in accordance with the procedures outlined in the DEC Standard Operating Procedure No 11.1, *Transport and Temporary Holding of Wildlife*.
- FA16** Interactions with animals (e.g. feeding, harassment, capture, killing) are not permitted unless specifically authorised by the Environmental Superintendent.
- FA17** Domestic pets will be prohibited on site.
- FA18** All sightings of non-indigenous fauna and conservation significant fauna will be reported to the Site Environmental Advisor.
- FA19** Atlas will implement feral animal control where sightings are regular and/or if nuisance or dangerous individuals are seen.
- FA29** If a non-indigenous fauna control program is implemented, a database of all feral animals captured will be maintained as a complement to the database of sightings.
- FL03** Clearing and disturbance of vegetation will be kept to the minimum necessary for safe construction and operation of the Project.
- FL06** Clearing will occur in accordance with Atlas' Ground Disturbance and Topsoil Management Procedure. No clearing will occur without prior authorisation from Atlas' Ground Disturbance Coordinator.
- FL12** Vehicle weed hygiene procedures will be implemented during construction for vehicles and equipment entering and departing the Project area.
- FL14** Disturbed areas will be progressively rehabilitated as soon as practicable.

5.2 Species-Specific Management

This section details management specific to species which have been **confirmed** to be present within the study area (as identified in Table 2) and are likely to be impacted by the Project; namely, the Northern Quoll, Pilbara Leaf-nosed Bat and Pilbara Olive Python.

Following the implementation of the standard management measures discussed in Section 5.1, The Project impacts on a local and regional scale to all other species **confirmed** to be present within the survey area, is likely to be Minimal (No population/ species decline expected) or Negligible (No perceived effect on population/species). As a result no species specific management has been developed for these species; namely, the Western Pebble-mound Mouse, Australian Bustard, Bush Stone-curlew, Rainbow Bee-eater and *Ramphotyphlops ganeai* (Un-named Blind Snake).

5.2.1 Northern Quoll

The presence of Northern Quolls (*Dasyurus hallucatus*) within the survey area was **confirmed** with the capture of one individual in Rocky Ridge and Gorge habitat during an Outback Ecology survey in autumn 2010 (see Figure 3). Scats for the species were also located in five other locations within Rocky Ridge and Gorge habitat, suggesting that the species is present throughout this habitat within the study area. In addition to the implementation of the standard management measures discussed in Section 5.1, Atlas is committed to implementing a species-specific management measure for the Northern Quoll:

- FA20** An annual Northern Quoll monitoring program will be implemented at Mt Webber, unless deemed unnecessary by DSEWPaC. Monitoring will be undertaken using techniques consistent with DSEWPaC and DEC requirements. The Northern Quoll monitoring program is detailed in Appendix 4.

5.2.2 Pilbara Leaf-nosed Bat

The presence of the Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) and the Ghost Bat (*Macroderma gigas*) within the survey area was **confirmed** with echolocation recordings from eight and five locations respectively, primarily from caves within Rocky Ridge and Gorge habitat (see Figure 3).

Cave MW-AN-27 (see Figure 3) has been identified as a significant day time roost critical to these species. This cave lies approximately 500 m north of the application area and will not be directly impacted by the Project. An existing exploration track lies within 20 m of this cave. It is understood from monitoring undertaken by Atlas and Outback Ecology (March 2012) that infrequent vehicle travel within 15 m of caves does not appear to affect the physical integrity of caves, or use of caves by Pilbara Leaf-nosed Bats. Infrequent use of the exploration track adjacent to MW-AN-27 is unlikely to significantly impact the populations of Pilbara Leaf-nosed Bats in MW-AN-27.

In addition to the implementation of the standard management measures discussed in Section 5.1, Atlas is committed to implementing a number of species-specific management measures for the Pilbara Leaf-nosed Bat. These include:

- FA21** The location of cave MW-AN-27 will be clearly demarcated on mine plans. An exclusion zone of 100 m will be implemented prior to ground disturbance to ensure this sensitive habitat is avoided. No mining or drilling will be allowed within the 100 m exclusion zone, and noise will be minimised as much as practicable. Access to the cave will not be

allowed other than by Atlas environmental staff and fauna specialists, for monitoring purposes.

- FA22** Pilbara Leaf-nosed Bats at Mt Webber will be monitored annually, unless deemed unnecessary by DSEWPaC. Monitoring will be undertaken using techniques consistent with DSEWPaC and DEC requirements.
- FA26** Atlas will trial the construction of artificial roosts by installing cave structures within waste rock dump material at the Project. This is proposed as a trial or case study, as opposed to an exercise in habitat restoration.
- FA27** The use of artificial roosts by Pilbara Leaf-nosed Bats at Mt Webber will be monitored by a fauna specialist twice in the first year following the completion of the artificial roost structures, and annually thereafter (concurrent with other annual monitoring).
- FA28** Atlas will commission a Regional Survey Plan for the Pilbara Leaf-nosed bat to enable a better understanding of the habitat use and requirement for the species.

The Pilbara Leaf-nosed Bat monitoring program is detailed in Appendix 4.

5.2.3 Pilbara Olive Python

The Pilbara Olive Python (*Liasis olivaceus barroni*) has been recorded twice at a substantial water pool within Rocky ridge and gorges habitat (see Figure 3). In addition to the implementation of the standard management measures discussed in Section 5.1, Atlas is committed to implementing species-specific management measures for the Pilbara Olive Python. These include:

- FA24** The water pool where the Pilbara Olive Python has been recorded will be avoided where possible.
- FA25** Pilbara Olive Pythons will be captured and relocated to suitable habitat by trained personnel should they be encountered during ground disturbance or operational activities.

6. PERFORMANCE CRITERIA AND CORRECTIVE ACTIONS

Performance criteria for this SSMP are provided in Table 3. Should the performance criteria not be met, corrective actions will be implemented.

Table 3 Performance criteria and corrective actions for conservation significant fauna

Performance Objective	Key Performance Indicator	Corrective Actions
No road kill incidents of conservation significant fauna.	No incident reports of road kill incidents of conservation significant fauna.	<ul style="list-style-type: none"> Identify likely cause of incident. Review speed limits and night time driving procedures. Review number of and locations of fauna signposts. Consider undertaking further training or re-running the education and awareness training to re-train personnel in fauna considerations.
No more than 756 ha will be cleared within the application area.	No clearing of more than 756 ha. No clearing outside the application area.	<ul style="list-style-type: none"> Identify likely cause of incident. Report to relevant government authorities. Retrain personnel in ground disturbance protocols. Undertake corrective rehabilitation. Check demarcation of areas to be cleared/not cleared has been undertaken and is obvious to those on the ground.
No observed decline to the Northern Quoll population in the study area taking into account naturally occurring high fluctuations in populations.	A decrease in capture rates no greater than 50% over two consecutive annual monitoring periods.	<ul style="list-style-type: none"> Review likely cause of decline. Review frequency of monitoring program. Review and revise management measures contained within the SSMP to prevent further decline. Report to relevant Commonwealth and state agencies.
No unauthorised access to MW-AN-27 exclusion zone (i.e. no unauthorised vehicle access within exclusion zone, no unauthorised foot access to areas away from the vehicle track).	No incident reports regarding access within the 100 m buffer around cave MW-AN-27	<ul style="list-style-type: none"> Review training and induction programs. Review number and locations of fauna signposts. Review the size of and need for barriers to exclusion zone (e.g. fencing).
No damage to significant bat roost MW-AN-27.	No damage to significant bat roost MW-AN-27.	<ul style="list-style-type: none"> Identify likely cause of damage. Increase inspection and monitoring frequency. Review blasting requirements and exclusion zone distances. Undertake monitoring of cave MW-AN-27, in liaison with DSEWPac and DEC, to determine effects of disturbance on the cave (physical structure, occupancy etc.) should future exploration work be required within the 100m exclusion zone.

Table 3 Performance criteria and corrective actions for conservation significant fauna (cont'd)

Performance Objective	Key Performance Indicator	Corrective Actions
No significant decline in Pilbara Leaf-nosed Bat occupancy in cave MW-AN-27.	No greater than 50 % decline of Pilbara Leaf-nosed Bat activity levels in significant bat caves over two consecutive monitoring periods*. *Should significant roosts be found to the north-west of the Study area, these should be used as control sites with which to compare activity levels.	<ul style="list-style-type: none"> • Review impact level and likely cause of impact. • Report to relevant Commonwealth and State agencies. • Review Pilbara Leaf-nosed Bat management plan.
Effective waste management procedures.	No records of feral animals within camp and administrative facilities (due to poor waste management).	<ul style="list-style-type: none"> • Identify likely cause of incident. • Review waste management protocols. • Retrain personnel. • Implement feral animal control program. • Review the feral animal management measures within this SSMP.
Successful implementation of the fire prevention and control management strategy.	No Project-related fires.	<ul style="list-style-type: none"> • Identify likely cause of incident. • Review fire prevention and control management strategy. • Retrain personnel and contractors.
Prevention of introduction or spread of weeds.	No records of Nationally Significant or Declared plants within the application area.	<ul style="list-style-type: none"> • Identify likely cause of incident. • Review weed management program. • Retain personnel and contractors. • Review weed monitoring and management program.
Trial the construction of artificial bat roosts within waste dumps.	Utilisation of artificial roosts by PLNB within one year of their construction.	<ul style="list-style-type: none"> • Investigate options for rehabilitation of vegetation at entrances to artificial roosts. • Investigate additional options for improving habitat value of artificial roosts, in consultation with bat specialists.
Effective management of feral predators.	No increase in numbers of feral animals within the vicinity of built infrastructure (as assessed by on site monitoring by Environmental Advisor).	<ul style="list-style-type: none"> • Implement feral animal control program. • Evaluate effectiveness of control and monitoring procedures. • Review the feral animal management measures within this SSMP.

7. AUDITING AND REVIEW

7.1 Audits

The Environmental Superintendent will be responsible for ensuring a compliance audit against the requirements of this SSMP is conducted every six months over the life of the Project.

7.2 Reviews

Atlas is committed to an initial review of the SSMP once the Project has received environmental approval. The SSMP will then be reviewed on an annual basis. All reviews will consider:

- Outcomes of fauna monitoring programs.
- Changes to the conservation status of fauna species.
- Specialist advice and stakeholder consultation.
- Implementation and effectiveness of management measures and monitoring programs.
- Performance indicators and any corrective actions.
- Changes to relevant legislation, policy, guidelines, management plans and industry practices.

The initial review will also make any amendments to the SSMP in order to comply with any conditions of approval that may be placed on the Project.

A number of triggers may also result in the immediate review of the SSMP, including:

- Recorded observations of a conservation significant species listed under the EPBC Act and/or Schedule 1, 2, 3 or 4 of the WC Act previously not confirmed to be present within the Project area. Species-specific management would need to be developed for these species.
- Incident report of a death/injury to any conservation significant fauna.

Review types are summarised in Table 4.

Table 4 Summary of SSMP review types

Review Type	Review Triggers
Initial	<ul style="list-style-type: none">• Upon receipt of environmental approval for the Project.
Annual	<ul style="list-style-type: none">• Twelve months after the initial review.
Immediate	<ul style="list-style-type: none">• Injury to conservation significant fauna is recorded.• Death of conservation significant fauna is recorded.• Conservation significant fauna not previously recorded in Project area is first recorded in Project area.

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8. REPORTING

This section provides a summary of Atlas reporting requirements under this SSMP.

8.1 Incident Reporting

All sightings, injuries and mortalities of conservation significant fauna and non-indigenous fauna within the project area will be reported to the Site Environmental Advisor within 24 hours, in accordance with the incident reporting procedures. All records will be entered into a significant species database and summaries will be included in Atlas's annual environmental report (AER).

Any injury or mortality to conservation significant fauna will be reported to the Department of Environment and Conservation within one week.

8.2 Fauna Specialist Reports

The fauna specialist conducting monitoring for conservation significant species for which species-specific management has been implemented will report to Atlas on each monitoring event. These specialist reports will be attached to, and summarised within that year's AER.

8.3 Annual Environmental Report

The AER will report on the results of the following monitoring programs:

- Northern Quoll monitoring program (detailed in Appendix 4).
- Pilbara Leaf-nosed Bat monitoring program (detailed in Appendix 5).

The AER will also provide a summary of conservation significant fauna sightings, injuries and mortalities within the Project area, as recorded by Atlas incident reporting system, as well as performance in accordance with the objectives, key performance indicators and corrective actions listed in Table 3.

Any significant changes to this SSMP will be noted in the AER.

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9. REFERENCES

- EPA. 2004. Guidance Statement No. 56. Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia. Environmental Protection Authority. Perth, Western Australia.
- Outback Ecology. 2012. Mt Webber DSO Project – Terrestrial Vertebrate Fauna Assessment. Unpublished report prepared by Outback Ecology Services for Atlas Iron Limited, Perth, Western Australia.

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Appendix 1

Definitions of conservation significance status for flora and fauna

Definition of State and Commonwealth Conservation Codes for Fauna

Status	Code	Description
<i>Categories used in Environment Protection and Biodiversity Act 1999</i>		
Endangered	E	A taxon is Endangered when the best available evidence indicates that it is considered to be facing a very high risk of extinction in the wild.
Vulnerable	V	A taxon is Vulnerable when the best available evidence indicates that it is considered to be facing a high risk of extinction in the wild.
Migratory	M	Species migrate to, over and within Australia and its external territories.
<i>Schedules of the Western Australian Wildlife Conservation Act 1950</i>		
Schedule 1	S1	Fauna that is rare or likely to become extinct.
Schedule 2	S2	Fauna that is presumed to be extinct.
Schedule 3	S3	Birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds.
Schedule 4	S4	Fauna that is in need of special protection, otherwise than for the reasons mentioned above.
<i>Priority Fauna Codes used by the Western Australian DEC</i>		
Priority 1: Taxa with few, poorly known populations on threatened lands.	P1	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 2: Taxa with few, poorly known populations on conservation lands.	P2	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 3: Taxa with several, poorly known populations, some on conservation lands	P3	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 4: Taxa in need of monitoring	P4	Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
Priority 5: Taxa in need of monitoring	P5	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.

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Appendix 2

Biological and ecological information on conservation significant species

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Table 2.7 Conservation significant fauna present or with the potential to occur in the study area

Scientific Name	Common Name	Conservation Status ¹		Description	Habitat and Distribution	Occurrence in Study Area ²	Level of Management
		EPBC Act	WC Act				
Mammals							
<i>Dasyurus hallucatus</i>	Northern Quoll	EN	S1	The Northern Quoll is a marsupial with a pointed snout, a long tail and brown to black fur with distinctive white spots. It weighs 350 to 1,000 g. Northern quolls live an average of two years, with males dying off after their mating season in winter. Their diet includes insects, birds, frogs, lizards, snakes, small mammals and fruit.	The Northern Quoll is both arboreal and terrestrial, inhabiting ironstone ridges, scree slopes of sandstone or ironstone and granite boulders and outcrops. It also inhabits drainage lines and riverine habitats, where it uses tree hollows as den sites. Northern Quoll populations have declined sharply in recent years, primarily due to the spread of invasive species such as the Cane Toad (<i>Bufo marinus</i>). One individual was captured at site MW-F-3 in the rocky ridge and gorge habitat during autumn 2010. The presence of scats at five other locations in the study area, also in the rocky ridge and gorge habitat, suggests the species is present throughout this habitat within the study area.	Confirmed	Species-specific
<i>Rhinonictis aurantia</i>	Pilbara Leaf-nosed Bat	VU	S1	This species is an isolated population of the Orange Leaf-nosed Bat (<i>Rhinonictis aurantius</i>). Leaf-nosed bats have a distinctive noseleaf similar to the horseshoe bats, although they lack a lancet. The Pilbara Leaf-nosed Bat usually has orange fur, but variants include fawn, lemon or golden colourings. Fur is usually darker on the back. Adults weigh 8 to 10 g.	The Pilbara Leaf-nosed Bat forages in <i>Triodia</i> hummock grasslands, small watercourses near granite koppies and around pools in riverine and gorge habitats. The species uses warm and humid caves for roosting. This species was confirmed at eight locations in the study area, primarily in caves in the rocky ridge and gorge habitat. Pilbara Leaf-nosed Bats were recorded in four caves in the study area, one of which (MW-AN-27) is considered to be a significant daytime roost. The other three caves received visits from individuals that likely were roosting elsewhere.	Confirmed	Species-specific
<i>Macroderma gigas</i>	Ghost Bat	–	P4	The Ghost Bat weighs 74 to 144 g and has a grey back with pale grey or white fur on their undersides. It feeds on a variety of species, including large insects, frogs, lizards, small mammals and other bats.	Ghost Bats occupy a variety of habitats from the arid Pilbara to the rainforests of northern Queensland. They roost in undisturbed and humid caves in deep fissures or abandoned mine shafts, typically in those with several entrances. Ghost Bats were recorded during the autumn and spring 2010 survey. There were unconfirmed records from caves MW-AN-15 and MW-AN-17, high confidence records from cave MW-AN-13 and confirmed records from caves MW-F-7 and MW-AN-27. Caves MW-F-7 and MW-AN-27 are both likely to be used regularly over consecutive nights and more than once in a season.	Confirmed	Standard
<i>Pseudomys chapmani</i>	Western Pebble-Mound Mouse	–	P4	The Western Pebble-mound Mouse is a brown mouse weighing 12 to 15 g. The species constructs characteristic mounds of pebbles around its burrows, covering 0.5 to 9.0 m ² .	The Western Pebble-mound Mouse has a preference for hilly, rocky landscapes with superficial cover dominated by bedrock. It is widespread throughout ranges in the Pilbara, and has been recorded from a wide range of surveys conducted in the region. This species was confirmed to be present during the autumn and spring 2010 and autumn 2012 surveys. Thirty-five pebble mounds were identified within granite uplands, stony rise and rocky foothills habitat, although none were noted as active.	Confirmed	Standard
<i>Lagorchestes conspicillatus leichardti</i>	Spectacled Hare-wallaby	–	P3	The Spectacled Hare-wallaby is a medium sized stocky marsupial with an adult weight of 1.6 to 4.75 kg. It is typically brown above, with white-tipped hairs and pale grey to white below with a bright orange to rufous ring around its eyes. Its tail is sparkly haired and its diet consists of grasses, shrubs and herbs.	The Spectacled Hare-wallaby inhabits <i>Triodia</i> hummock grasslands, tussock grasslands and <i>Acacia</i> shrublands. This species has been recorded nearby during surveys of the Abydos-Woodstock Reserve, and also 30 km to the northwest of the study area at CBH Sulphur Springs Panorama Project. As suitable habitat (i.e. Spinifex sandplain habitat) is present in the study area, the Hare-wallaby is considered likely to occur.	Likely	Standard
<i>Leggadina lakedownensis</i>	Lakeland Downs Mouse	–	P4	This species is grey brown to grey mouse with a pure white underside. Mainland adults typically weigh 15 to 20 g. Its diet consists of invertebrate material with plants to supplement its water intake.	The Lakeland Downs Mouse uses a variety of habitats including spinifex and tussock grasslands, samphire and sedgeland, <i>Acacia</i> shrublands, topical <i>Eucalyptus</i> woodlands and stony ranges. This species was not recorded during any of the autumn and spring 2010 and autumn 2012 surveys. However, regional records for the species exist. Additionally, the spinifex sandplain, spinifex stony plain and <i>Acacia</i> , spinifex on sandplain habitats represent suitable habitat for the species. The Lakeland Downs Mouse is therefore considered likely to occur in the study area.	Likely	Standard
<i>Mormopterus loriae cobourgiana</i>	Mangrove Freetail-bat	–	P1	Free-tailed bats are characterised by the length of the tail projecting out from the tail membrane and by the lack of noseleaf. The Mangrove Freetail-bat is 47 to 55 mm long and has a tail length of 30 to 36 mm. It is fast flyer that reaches speeds of up to 25 km/h. It forages above and beside the tree canopy and through gaps formed by creeks and roads. The bat feeds on beetles, bugs, flying ants and leafhoppers.	The Mangrove Freetail-bat occurs in coastal areas and is restricted to mangrove forests and other dense vegetation associated with coastal waterways. The Mangrove Freetail-bat has not been recorded as far inland as the study area (presumably due to a lack of suitable habitat) and is therefore considered unlikely to occur in the study area.	Unlikely	Standard

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Table 2.7 Conservation significant fauna present or with the potential to occur in the study area (cont'd)

Scientific Name	Common Name	Conservation Status ¹		Description	Habitat and Distribution	Occurrence in Study Area ²	Level of Management
		EPBC Act	WC Act				
Mammals (cont'd)							
<i>Dasycercus cristicauda</i>	Brush-tailed Mulgara	–	P4	The Mulgara is a carnivorous marsupial with a pointed snout and short, rounded ears. Adults weigh 60 to 110 g and may live for more than six years. The fur is a light sandy brown colour above and a greyish white below. The hairs on the tail are reddish at the base and black on the distal two-thirds.	Although <i>D. blythi</i> was described more than a century ago, in recent years it has been grouped with the Crest-tailed Mulgara, <i>D. cristicauda</i> . It is under this incorrect species name that the Brush-tailed Mulgara is currently listed as vulnerable under the EPBC Act (with the common name 'Mulgara'). In WA, the Brush-tailed Mulgara is listed under its correct name, <i>D. blythi</i> , as Priority 4 fauna by the DEC. The Brush-tailed Mulgara (<i>D. blythi</i>) is a nocturnal hunter that occurs in arid and semi-arid zone habitats in association with dune systems. It has been known from Spinifex grasslands, sand plains and mulga shrublands with loamy soils. The Mulgara has not been recorded from any of the autumn and spring 2010 and autumn 2012 surveys. However, database records suggest the Mulgara has the potential to occur in the study area, and previous surveys in the area have recorded its presence in Spinifex sandplain habitat, of which the study area contains substantial areas. The Mulgara is therefore considered very likely to occur in the study area.	Very likely	Standard
<i>Dasycercus blythi</i>	Crest-tailed Mulgara	VU	S1				
<i>Macrotis lagotis</i>	Greater Bilby	VU	S1	Bilbies have large rabbit-like ears, a pointed snout, silky fur and a long well-furred tail with a terminal white tuft. Adults weigh 800 to 2,500 g. Their diet includes insects and their larvae, seeds, bulbs, fruit and fungi.	The Bilby is found in inland habitats such as desert sandplains, dune fields with hummock grasslands, massive red earths and Acacia shrublands. A decline in the Bilby’s numbers is thought to be due to predation by foxes and cats, with ongoing threats from competition with introduced herbivores, habitat degradation and habitat destruction from development activities. The Bilby was not recorded during any of the autumn and spring 2010 and autumn 2012 surveys. However, database records suggest the Bilby has the potential to occur in the study area (i.e. within Spinifex sandplain habitat), and one study in the region recorded its presence. The Bilby’s presence in the study area is therefore considered possible.	Possible	Standard
Reptiles							
<i>Liasis olivaceus barroni</i>	Pilbara Olive Python	VU	S1	The Pilbara Olive Python is a dull olive-brown to pale fawn or rich brown colour and is Western Australia’s largest snake species. It has a white or cream belly and can grow to 4 m, with an average length of 2.5 m. Its diet includes rock wallabies, euros, fruit bats, ducks, corellas, spinifex pigeons and coucals. Reptiles and frogs are probably also taken by smaller Pilbara Olive Pythons.	The Pilbara Olive Python inhabits rocky escarpments, deep gullies and gorges within the Pilbara region and is often recorded near waterholes and riverine habitats. The Pilbara Olive Python was recorded three times during the autumn and spring 2010 surveys (one of these records was a deceased individual) within rocky ridge and gorge habitat. Records from previous nearby surveys in similar habitats also exist.	Confirmed	Species-specific
<i>Ramphotyphlops ganei</i>	Unnamed Blind Snake	–	P1	<i>Ramphotyphlops ganei</i> is a blind snake averaging about 30 cm in length.	Relatively little about <i>R. ganei</i> ’s preferred habitat is known due to the lack of sightings of the species. However, it is thought to inhabit moist gorges and gullies. <i>R. ganei</i> was recorded in the rocky ridge and gorge habitat during the spring 2010 survey. An additional record of <i>R. ganei</i> was made during a separate survey for SRE species in autumn 2010. The species is likely to exist elsewhere in the study area based on the assumption that the rocky ridge and gorge habitat represents <i>R. ganei</i> ’s preferred habitat.	Confirmed	Standard
<i>Ctenotus nigrilineatus</i>	Pin-striped Finesnout Ctenotus	–	P1	This skink has comb-like projections at its ear openings and striped patterns running the length of its body.	This poorly-known species is endemic to the Pilbara and is only known to occur in Triodia pungens hummock grassland at the base of granite outcrops. Only one record of this species exists for the wider region. The Pin-striped Finesnout Ctenotus was not recorded during the autumn and spring 2010 and autumn 2012 surveys. As its preferred habitat exists within the study area, it is considered possible that this species occurs within Spinifex sandplain of the study area.	Possible	Standard
<i>Ctenotus uber johnstonei</i>	Spotted Ctenotus	–	P2	The Spotted Ctenotus is oviparous and has an average snout-to-vent length of 7 cm.	This species is known only from a few records and is associated with hard reddish soils from inland Western Australia. Records of this species in the region exist though they are few in number. The Spotted Ctenotus was not recorded during the autumn and spring 2010 and autumn 2012 surveys. It is possible that species exists in the study area, although this estimation is putative due to the paucity of available data.	Possible	Standard
Birds							
<i>Pezoporus occidentalis</i>	Night Parrot	EN	S1	Night Parrots are considered a medium-sized parrot at 22 to 25 cm in length and with a wingspan of about 45 cm. Primary colouring is bright green with yellow and black bars. The species is rare and is known only from a limited number of records.	Little is known about the Night Parrot’s movement patterns. Sightings of the species are rare but it is likely to be a nomadic species occurring across much of arid Australia. The Night Parrot was not recorded during any of the autumn and spring 2010 and autumn 2012 surveys. Although there is one record of the species from a survey of the Cloud Break Project area in 2005, the species is unlikely to occur within the study area.	Unlikely	Standard

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Table 2.7 Conservation significant fauna present or with the potential to occur in the study area (cont'd)

Scientific Name	Common Name	Conservation Status ¹		Description	Habitat and Distribution	Occurrence in Study Area ²	Level of Management
		EPBC Act	WC Act				
<i>Birds (cont'd)</i>							
<i>Falco peregrinus</i>	Peregrine Falcon	–	S4	The Peregrine Falcon is a large falcon with a wingspan of 80 to 120 cm. It has a blue-grey back, barred white underparts and a black head and moustache. It feeds almost exclusively on medium-sized birds, occasionally hunting small mammals, reptiles and even insects.	This species has a home range of approximately 20 to 30 km ² and uses inland cliffs and tree hollows in open woodlands near water for breeding. Its preferred habitats include rocky escarpments and gorges, cliffs, tree-lined watercourses, open woodland and Acacia shrublands. The Peregrine Falcon was not recorded during any of the autumn and spring 2010 and autumn 2012 surveys. As other records from the region exist, this species is considered likely to occur in the study area. However, it is unlikely to be dependent solely on the study area for its habitat (i.e. cliff lines within rocky ridge habitat or riverine habitat), given the species' mobility.	Likely	Standard
<i>Ardeotis australis</i>	Australian Bustard	–	P4	The Bustard is a large ground-nesting bird that grows up to 1.2 m tall and weighs up to 7.5 kg. Its wingspan can be as great as 2.3 m. The Bustard feeds primarily on insects.	This species inhabits open dry mulga woodlands, arid scrublands and hummock and tussock grasslands. It has a wide distribution across Australia. The Australian Bustard was recorded on eight occasions during the autumn and spring 2010 and autumn 2012 surveys (from both sightings and distinctive tracks) in riverine, spinifex stony plain, and Acacia, spinifex on sandplain habitats. These same habitats are widespread outside the study area and as such the Bustard is not expected to be solely dependent upon habitat within the study area.	Confirmed	Standard
<i>Burhinus grallarius</i>	Bush Stone-curlew	–	P4	The Bush Stone-curlew is a large nocturnal bird that grows to a height of 50 to 60 cm. It has long legs, large yellow eyes and grey-streaked upper parts. The Bush Stone-curlew feeds pm frogs, insects, molluscs, crustaceans and reptiles, and has a distinctive, eerie whistle.	This species inhabits open woodland and forest, particularly near watercourses or swampy areas. The Bush Stone-curlew was recorded twice in the autumn and spring 2010 and autumn 2012 surveys in the spinifex stony plain habitat by sightings. Tracks from this species were also found. The Bush Stone-curlew has been recorded in previous studies in the region and, due to the presence of similar habitat throughout the wider region, it is unlikely to be solely dependent on habitat in the study area.	Confirmed	Standard
<i>Falco hypoleucos</i>	Grey Falcon	–	P4	The Grey Falcon is a nomadic predatory species that preys on birds, mammals, reptiles and insects.	The Grey Falcon occurs predominantly around inland ephemeral and permanent drainage systems where annual rainfall is less the 500 mm. It inhabits lightly wooded countryside, in particular stony plains and Acacia scrublands. The Grey Falcon was not recorded during the autumn and spring 2010 and autumn 2012 surveys. However, the species has been recorded in other surveys in the local area and wider region. It is possible that the species could occur in the study area given the presence of suitable habitat (i.e. Spinifex stony plain or riverine habitat).	Possible	Standard
<i>Neochmia ruficauda subclarescens</i>	Western Star Finch	–	P4	The Western Star Finch has a bright red face and beak and an olive green back with a beige-like underbelly. Tiny white star-like dots cover the crown of its head. Its diet consists of seeds, vegetative material, termites and insect larvae and it can be seen feeding on the ground or in low scrub in groups of up to 20 individuals.	This species can be found in lush, green woodland vegetation along temporary or permanent watercourses, the margins of swamps or in green crops. The Western Star Finch was not recorded during the autumn and spring 2010 and autumn 2012 surveys. However, records exist from the Abydos-Woodstock Reserve and Indee Homestead (to the west and northwest respectively) It is possible that the species could occur in the study area given the presence of suitable habitat (i.e. riverine and drainage line habitat).	Likely	Standard
<i>Numenius madagascariensis</i>	Eastern Curlew	M	P4	The Eastern Curlew is a large migrant wader, with an 18 cm pink-based, down-curved bill nearly half the length of its body. The species is active at night, especially during low tide.	The Eastern Curlew is a migratory species that migrates from Siberia and Mongolia. When in Australia, the species migrates predominantly to southeast Queensland, with some populations found in coastal areas of Western Australia. The Eastern Curlew was not recorded during the autumn and spring 2010 and autumn 2012 surveys. Despite being identified in one previous survey in the local area, the eastern curlew is not expected to occur in the study area due to the absence of the mangrove woodland or tidal zone habitat it requires.	Unlikely	Standard
<i>Merops ornatus</i>	Rainbow Bee-eater	M	–	The Rainbow Bee-eater is a small bird growing to 24 cm in length and weighing 20 to 25 g. Its plumage is distinctively coloured, with a black tail, pale blue back, cinnamon-brown wings and pale green head and nape.	The Rainbow Bee-eater inhabits woodlands, sandpits, riverbanks, road cuttings, beaches, cliffs, mangroves and rainforests. Its distribution covers all of mainland Australia. The Rainbow Bee-eater was recorded during the autumn and spring 2010 and autumn 2012 surveys within spinifex sandplain, granite upland and rocky foothill habitat. It has also been recorded in all other previous surveys in the wider region.	Confirmed	Standard
<i>Apus pacificus</i>	Fork-tailed Swift	M	–	The Fork-tailed Swift is a medium-sized swift weighing 30 to 40 g, with length of about 20 cm and wingspan of 40 cm. It has a white band across its rump but is otherwise mostly black. The Fork-tailed Swift has a characteristic deeply forked tail.	This species is almost exclusively airborne but may be found near foothills and cliffs in coastal areas. The species feeds on insects, which tend to occur more abundantly in the periods surrounding storm fronts or tropical cyclones. The Fork-tailed Swift was not recorded during the autumn and spring 2010 and autumn 2012 surveys. The species is unlikely to require habitat that is present in the study area, although it may fly over the study area.	Possible	Standard

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Table 2.7 Conservation significant fauna present or with the potential to occur in the study area (cont'd)

Scientific Name	Common Name	Conservation Status ¹		Description	Habitat and Distribution	Occurrence in Study Area ²	Level of Management
		EPBC Act 1999 (Cwlth)	WC Act 1950 (State)				
<i>Birds (cont'd)</i>							
<i>Ardea ibis</i>	Cattle Egret	M	–	The Cattle Egret is a small, stocky bird that weighs up to 390 g and has a wingspan of up to 91 cm. It is mostly white with a short neck and a yellow-red bill. Its name follows from the species' tendency to eat ticks and flies from the backs of livestock.	This species is associated with inland rivers and lakes that contain surface water. Its distribution in Australia is almost nationwide, with the exception of some interior parts of Western Australia, South Australia and the Northern Territory. The Cattle Egret was not recorded during the autumn and spring 2010 and spring 2012 surveys. Existing records of the species are generally from coastal areas. The species could possibly occur in water pools in riverine habitat of the study area.	Possible	Standard
<i>Charadrius veredus</i>	Oriental Plover	M	–	The Oriental Plover is a medium-sized plover with long legs, weighing 95 g at a length of 21 to 25 cm. The species normally occurs in flocks of hundreds or sometimes thousands of birds.	The Oriental Plover is a non-breeding visitor to Australia, with most important populations in northern Western Australia between the Exmouth Gulf and Derby. It particularly favours short, dry grasslands and recently burnt areas. It occasionally feeds in wet habitats and may visit mudflats and beaches in warm conditions. The Oriental Plover was not recorded during the autumn and spring 2010 and spring 2012 surveys. Suitable habitat for the species (recently burnt grasslands on spinifex sandplain and riverine habitats) exist, so the species could possibly occur in the study area.	Possible	Standard
<i>Actitis hypoleucos</i>	Common Sandpiper	M	–	The Common Sandpiper is a small sandpiper with a wingspan of 32 to 35 cm and a length of 19 to 21 cm. Its colouring is a dark brown with occasional barring. It has a prominent white eye-ring.	The Common Sandpiper uses a wide range of coastal and inland wetlands, occasionally venturing into grasslands adjacent to water features. It has a scattered but wide distribution around Australia, predominantly around coastal areas. This species was not recorded in the autumn and spring 2010 and autumn 2012 surveys. Recent records are from coastal areas or major water bodies only, and this habitat is not present in the study area.	Unlikely	Standard
<i>Glareola maldivarum</i>	Oriental Pratincole	M	–	The Oriental Pratincole is a medium-sized, tern-like shorebird. It measures about 24 cm long, weighs about 75 g and has long, pointed wings and a forked tail. In northern Australia, they occur in small to large flocks.	The Oriental Pratincole is widespread across northern Australia, particularly in coastal areas of the Pilbara and Kimberley. The species inhabits open plains, floodplains and short grasslands, and can be found near terrestrial wetlands. This species was not recorded in the autumn and spring 2010 and autumn 2012 surveys. Recent records are from coastal areas or major water bodies only, and this habitat is not present in the study area.	Unlikely	Standard
<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle	M	–	The White-bellied Sea-eagle is a large predatory bird with long, broad wings and a short, wedge-shaped tail. It is 75 to 85 cm long, has a wingspan of 180 to 220 cm and weighs up to 4.2 kg. The Sea-eagle is predominantly white and grey, with darker colours on top and black on the ends of the wings.	This species is found in coastal habitats and areas with large expanses of open water. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland and forest. It is found all around Australia though not in the arid interior. This species was not recorded in the autumn and spring 2010 and autumn 2012 surveys. Recent records are from coastal areas or major water bodies only, and this habitat is not present in the study area.	Unlikely	Standard
<i>Hydroprogne caspia</i>	Caspian Tern	M	–	The Caspian Tern is the largest tern in Australia at up to 60 cm in length and an average weight of 680 g. It has a heavy red bill, a slightly forked tail, and long, backswept wings. Its overall colouring is white and light grey.	The Caspian Tern is widespread in coastal areas of Western Australia and is typically found in sheltered coastal wetland environments, preferring water features with sandy or muddy margins. They can also be found in inland locations where there are lakes, waterholes, rivers and creeks. This species was not recorded in the autumn and spring 2010 and autumn 2012 surveys. Recent records are from coastal areas or major water bodies only, and this habitat is not present in the study area.	Unlikely	Standard
<i>Numenius phaeopus</i>	Whimbrel	M	–	The Whimbrel is a medium-sized curlew with dark brown plumage above and white below. It is 40 to 45 cm long and weighs about 350 g.	The Whimbrel inhabits sheltered coastal environments such as intertidal mudflats, harbours, lagoons, estuaries and river deltas. It is often found in areas with mangroves. A small number of records place the species at inland lakes and swamps. This species was not recorded in the autumn and spring 2010 and autumn 2012 surveys. Recent records are from coastal areas or major water bodies only, and this habitat is not present in the study area.	Unlikely	Standard
<i>Tringa brevipes</i>	Grey-tailed Tattler	M	–	The Grey-tailed Tattler is a medium-sized diurnal wader, about 25 cm long and weighing 125 g. Its bill is straight and its legs short and yellow. It has plain grey plumage above and slate grey plumage below.	The Grey-tailed Tattler prefers sheltered coastal regions with mudflats, reefs, rocky platforms, estuaries and lagoons, especially those fringed with mangroves. It is more abundant in northern Australia. This species was not recorded in the autumn and spring 2010 and autumn 2012 surveys. Recent records are from coastal areas or major water bodies only, and this habitat is not present in the study area.	Unlikely	Standard

Table 2.7 Conservation significant fauna present or with the potential to occur in the study area (cont'd)

Scientific Name	Common Name	Conservation Status ¹		Description	Habitat and Distribution	Occurrence in Study Area ²	Level of Management
		EPBC Act 1999 (Cmlth)	WC Act 1950 (State)				
Birds (cont'd)							
<i>Tringa glareola</i>	Wood Sandpiper	M	–	The Wood Sandpiper is a small wader with a wingspan of 57 cm and length of 19 to 23 cm. It weights 55 g and has a short, straight bill and long legs. Colourings include dark grey-brown above and white and grey below.	The Wood Sandpiper is most abundant in northwest Australia and uses shallow freshwater wetlands where there is plenty of fringing vegetation. This species was not recorded in the autumn and spring 2010 and autumn 2012 surveys. Recent records are from coastal areas or major water bodies only, and this habitat is not present in the study area.	Unlikely	Standard
<i>Tringa nebularia</i>	Common Greenshank	M	–	The Common Greenshank is a 30 to 35 cm wader with a wingspan of 55 to 65 cm. It weighs up to 190 g and has a long, slightly upturned bill. It has long legs with dark plumage on top and light grey below.	The Common Greenshank typically occurs in sheltered coastal habitats, typically those with large mudflats and saltmarsh. It can also use ephemeral terrestrial wetlands such as swamps, creeks, waterholes and inundated floodplains. This species was not recorded in the autumn and spring 2010 and autumn 2012 surveys. Recent records are from coastal areas or major water bodies only, and this habitat is not present in the study area.	Unlikely	Standard

Sources: Outback Ecology (2011, 2012).

1. Conservation significance codes are as follows:

Environment Protection and Biodiversity Conservation Act 1999 (Cwlth) (EPBC Act) conservation status definitions:

Endangered (EN) A taxon is Endangered when the best available evidence indicates that it is 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 is considered to be facing a high risk of extinction in the wild.

Migratory (M) Species migrate to, over and within Australia and its external territories.

Wildlife Conservation Act 1950 (WA) (WC Act) conservation status definitions:

Schedule 1 (S1) Fauna that is rare or likely to become extinct.

Schedule 2 (S2) Fauna that is presumed to be extinct.

Schedule 3 (S3) Birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds.

Schedule 4 (S4) Fauna that is in need of special protection, otherwise than for the reasons mentioned above.

Priority 1 (P1) Taxa that 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 2 (P2) Taxa that 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 3 (P3) Taxa that 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 4 (P4) Taxa that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.

Priority 5 (P5) Taxa that 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.

2. Likelihood of occurrence definitions are as follows (Outback Ecology, 2012):

Confirmed Presence in study area recorded unambiguously during the last ten years (i.e. recent surveys of study area or via database searches).

Very Likely Study area lies within the species' known distribution and contains suitable habitat(s), plus the species generally occurs in suitable habitat and has been recorded nearby in the last 20 years.

Likely Study area lies within the species' known distribution and the species has been recorded nearby in the last 20 years, although either (a) the study area contains habitat that is marginally suitable, or only a small area of suitable habitat, or (b) the species is generally rare and patchily distributed in suitable habitat.

Possible Outside chance of occurrence based on any of (a) the study area is just outside the known distribution, although it contains suitable and sufficient habitat, (b) study area lies within the known distribution but the species is very rare and/or patchily distributed, or (c) study area lies on the edge or within the known distribution and has suitable habitat, but the species has not been recorded in the area for over 20 years.

Unlikely Study area lies outside the species' known distribution, does not contain suitable habitat and the species has not been recorded in the area for over 20 years.

References:

Outback Ecology 2011 Mt Dove DSO Project: Vertebrate Fauna Assessment. Unpublished report prepared by Outback Ecology Services for Atlas Iron Limited, Perth, Western Australia.

Outback Ecology 2012 Mt Webber DSO Project: Terrestrial Vertebrate Fauna Impact Assessment. Unpublished report prepared by Outback Ecology Services for Atlas Iron Limited, Perth, Western Australia.

Significant Species Management Plan
Mt Webber DSO Project
APPENDIX 2

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Appendix 3

DEC guidelines for the transport and temporary holding of wildlife



Department of
Environment and Conservation

Our environment, our future



DEC Nature Conservation Service

Biodiversity

Standard Operating Procedure

Transport and temporary holding of wildlife

SOP No: 11.1

Prepared by:

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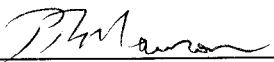
Resource Condition Monitoring – Significant Native Species & Ecological Communities Project
Department of Environment and Conservation's Animal Ethics Committee


Version 1.0 (February 2009)

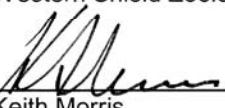
Revision History Log

Version #	Revision Date	Author	Changes

*Approvals***Version 1.0**

Approved by:  Date: 23/2/09
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 Chair, DEC Animal Ethics Committee

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Approved by:  Date: 5-3-09
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1 Purpose

In most situations, animals that are trapped are released at their point of capture shortly after being identified and required observations and measurements taken. However, certain circumstances, such as translocation or collection of live voucher specimens, involve the temporary holding and/or transport of live animals.

This standard operating procedure (SOP) provides advice on the temporary holding and transport of wildlife using hard and soft containment methods.

2 Scope

This standard operating procedure applies to the transportation of wildlife by Department of Environment and Conservation (DEC) personnel. It is of particular relevance to translocation of fauna for conservation purposes. It may also be used to guide wildlife transport and temporary holding undertaken of wildlife by NRM groups, consultants, researchers and any other individuals or organisations.

This SOP compliments the advice contained in SOP 10.1 Animal handling/restraint using soft containment. It does not cover the transport and temporary holding of livestock.

This standard operating procedure complies with, and expands on, Section 4.2 and Section 5.5 of the *Australian Code of Practice for the Care and Use of Animals for Scientific Purposes* (The Code). The Code also contains an introduction to the ethical use of animals in wildlife studies and should be referred to for broader issues. A copy of the code may be viewed by visiting the National Health and Medical Research Council website (<http://www.nhmrc.gov.au/>). In Western Australia any person using animals for scientific purposes must be covered by a licence issued under the provisions of the Animal Welfare ACT 2002, which is administered by the Department of Local Government and Regional Development.

3 Definitions

Hard containment: Use of hard materials to contain the movement of animals to assist handling and restraint.

Soft containment: Use of soft materials to contain the movement of animals to assist handling and restraint.

Wildlife: Free-living animals of native, non-indigenous or feral species including captive-bred animals and those captured from free-living populations (NHMRC, 2004).

4 Approved Methods

4.1 Temporary holding

There are many methods used to temporarily hold live animals (Table 1). The most suitable method will depend on the species being held and the duration of containment. In general, mammals and reptiles are best temporarily contained in cloth bags, frogs in plastic bags or container with some water, and birds in either cloth bags or holding cages. Soft containment methods are generally used for short to medium duration trips and hard containment methods are used for longer duration trips where greater security of animals required.

Table 1: Methods approved for temporary holding and transport of wildlife.

Containment type	Containment method	Used for
Soft	Zip lock plastic bag	Small frogs and reptiles
Soft	Freezer bag	Small frogs and reptiles
Soft	Calico bag	Small mammals, birds, frogs and reptiles
Soft	Hessian/jute bag	Medium sized macropods e.g. tammar
Soft	Heavy cotton or synthetic (e.g. polar fleece)	Small to medium sized mammals
Hard	Plastic container (ventilated)	Large frogs, tadpoles, frog spawn
Hard	Pet pack	Mammals and medium to large sized birds e.g. cockatoos
Hard	Cage trap	Mammals
Hard	Transportation box	Birds

In some cases hard containment methods may be used to store multiple animals held in soft containment bags so that they may be stacked for transport whilst maximising ventilation. However, they must be restrained within the hard containment so that the bagged animals are not able to roll and suffocate each other or restrict air flow. In the case of pet packs the containment bags can be tied to the diagonal corners of a pet pack.

4.2 Transport

Animals may be transported on the ground, by water or by air depending on the circumstances and distance needing to be travelled (Table 2).

Table 2: Modes of transport for movement of wildlife.

Transport containment method	Situation used
Air conditioned vehicle	Short and medium distances (less than 12 hours duration)
Air transport (Pressurised compartment)	Long distance or remote
Boat	Island to mainland or vice versa. Up or down rivers where road transport is less efficient.

There are a number of things to consider for each of these modes of transport and these are outlined in the following sections.

4.2.1 Ground transport by airconditioned vehicle

- Ensure animals are well secured from escape or movement about the vehicle during travel.
- Ensure that the temperature in the cargo space of the vehicle where the animals are held does not exceed 25 degrees C. A temperature thermometer with multiple sensors is recommended so that the temperature at the front and rear of the vehicle can be monitored by the driver.
- Vehicles used to transport animals must be airconditioned and have a false bottom (in some vehicles there is no floor insulation from the heat generated by the vehicle exhaust system and this can lead to heat stress and potentially death).
- Animals must not be placed in the boot or on the dash of a vehicle.
- Never leave collected animals where they may be exposed to direct sunlight, get wet or get too cold.

4.2.2 Air transport

- Ensure animals are well secured from escape or movement about the aeroplane or helicopter during travel.
- Ensure that transportation by air is undertaken in accordance with *International Air Transportation Association (IATA) Live Animal Regulations*.

- (c) When transporting live animals by jet turbine helicopter, animals are to be placed in the cabin or if this is not possible then in a well-ventilated boot (free of other cargo), away from the heat of the jet engine exhaust and checked regularly. Secure boxes should allay any fear that pilots may have about animals escaping.
- (d) Ensure animals are not stowed in close proximity to exhaust gases or subject to radiated heat generated by the engine/s.

4.2.3 Boat transport

- (a) Ensure animals are well secured from escape or movement about the boat during travel.
- (b) Ensure animals are stowed in a dry well ventilated location. Preference is to be given to placing the animals near the centre of the boat to provide for a better ride which is particularly important if experiencing rough sea conditions.

5 Procedure Outline

5.1 Construction of temporary holding containers

- (a) The containers must be designed, constructed and appropriately-sized for the purpose that they are being used.
- (b) The containers must be secure and escape-proof.
- (c) The container must provide adequate ventilation.
- (d) There should be adequate nesting or bedding material available appropriate for the species being transported.
- (e) An inner shelter within the transportation container must be provided if appropriate for the species (e.g. western ringtail possum being transported in a pet pack).

5.2 Care during temporary containment

- (a) Limit exposure of animals to sudden movements, extremes of temperature, noise, visual disturbance and vibration.
- (b) For most species the temperature should be kept to below 25 degrees C.
- (c) Food and water/moisture must be provided when necessary.
- (d) Ensure that animals are separated where there is incompatibility of species, age, sex or reproductive status.
- (e) Held animals should be monitored frequently for signs of distress, although this needs to be balanced against the desirability of limiting disturbance.
- (f) Prevent unnecessary handling.
- (g) Administer tranquilising agents by skilled personnel where appropriate.
- (h) Ensure animals are not left where they may be accidentally trampled or forgotten.
- (i) Mammals transported in pet packs and cage traps should be secured in calico bags prior to placement in transport device. Ensure that the pet pack is not so big that an animal can roll around in it leading to potential injuries.

5.3 Cleaning and disinfecting temporary holding containers

- (a) Temporary holding containers must be cleaned and disinfected after each use. Advice on cleaning and disinfection is available in Chapman *et al.* (2008).

5.4 Record keeping for transport of animals

- (a) Ensure that both suppliers and recipients of animals have satisfactory delivery procedures, with animals being received by a responsible person and appropriate paperwork is completed.
- (b) For translocations, ensure that a Translocation Proposal has been written in accordance with DEC's Policy Statement No 29 and approved.
- (c) If animals are being transported interstate then an export permit is required to be issued under the *Wildlife Conservation Act 1950*. Note that this permit will not be issued unless the State to which the fauna is being exported has approved the fauna entering that State.
- (d) Ensure temporary holding containers are adequately labelled e.g. "Caution – Live Animals" (Figure 1).



Figure 1 Labelled container for transport of a venomous snake.

- (e) Animals being transported to the WA Museum must have accompanying specimen data. An animal without data is useless for nearly all purposes for which it may have been collected.

6 Level of Impact

The impact of temporary containment and transportation of wildlife is potentially high given the animals are completely dependent on those responsible for their welfare. Transportation can cause distress due to confinement, movement, noise and changes in environment and personnel. The conditions and duration of the transportation must be managed to ensure that the impact on animal health and welfare is minimised.

7 Ethical Considerations

To reduce the level of impact of transport and temporary holding of wildlife on the welfare of animals there are a number of ethical considerations that should be addressed throughout projects involving these procedures. DEC projects involving the transport or temporary holding of wildlife will require approval from the DEC Animal Ethics Committee and where appropriate the following ethical considerations must be adequately covered in any Application for Approval to Undertake Research Involving Vertebrate Animals.

7.1 Biological and behavioural requirements of animals

Consideration should be given to both the biological as well as behavioural requirements of animals when subjecting them to containment or confinement for extended periods of time such as that required for transport.

In general animals are better able to cope with stress at low temperatures and low humidity. Transport should not occur if temperature cannot be maintained below 25 degrees C.

The extent of any distress will depend on the animals' health, temperament, species, age and sex, the number of animals travelling together and their social relationships, the period without food and water, the duration and mode of transportation, environmental conditions, particularly extremes of temperature, and the care given during the journey (NHMRC, 2004).

Consider the nature of the species being transported as some species (e.g. *Perameles bougainville bougainville*) may eat their young when being transported.

7.2 Duration of transport

Temporary containment should be of the shortest duration possible. Animals must be released within 24 hours of capture unless justification can be provided and is approved by the DEC Animal Ethics Committee.

If an extended travel or transport period is necessary (e.g. to transport live specimens to a museum) then animals need to be regularly checked, hydrated, faeces removed and provided with sufficient shelter whilst in temporary containment. Bags should only be used in such situations for a maximum of one week unless longer periods can be justified and have been specifically approved by the DEC Animal Ethics Committee. Animals being held any longer than two weeks should not be kept in temporary containers. They require appropriate husbandry such as a vivarium for reptiles or frogs, with appropriate heating and lighting, water, food and shelter. Such holding facilities would be classified as an animal housing facility and would need to be approved by the DEC Animal Ethics Committee.

Live animals collected for the museum must be lodged for processing as soon as possible. If this cannot be achieved then the animals should be examined and released or euthanased if appropriately trained personnel are available.

7.3 Unexpected deaths

If unexpected deaths or euthanasias occur then it is essential to consider the possible causes and take action to prevent further deaths. For projects approved by the DEC Animal Ethics Committee, unexpected deaths or euthanasias must be reported in writing to the Animal Ethics Committee Executive Officer on return to the office (as per 2.2.28 of The Code).

7.4 Spread of disease or parasites

Transport and re-use of equipment (e.g. handling bags) as well as the transport of animals pose the risk of also transporting novel diseases and parasites. Animals showing signs of disease or ill health must not be translocated (Chapman *et al.* 2008). Good hygiene practices should be maintained to reduce the risk of spreading pathogens or parasites between sites.

8 Competencies and Approvals

DEC personnel, and other external parties covered by the DEC Animal Ethics Committee, undertaking transport and temporary holding of wildlife require approval from the committee and will need to satisfy the competency requirements detailed in Table 1. This is to ensure that personnel involved have the necessary knowledge and experience to minimise the potential impacts of transport and temporary holding on the welfare of the animals. Other groups, organisations or individuals using this SOP to guide their fauna monitoring activities are encouraged to also meet these competency requirements as well as their basic animal welfare legislative obligations.

It should be noted that the details, such as intensity of the study being undertaken will determine the level of competency required and Table 3 provides advice for basic monitoring only.

Table 3: Competency requirements for Animal Handlers of projects involving transportation and temporary holding of wildlife.

Competency Category	Competency Requirement	Competency Assessment
Wildlife licences	1.1 Licence to take fauna for scientific purposes (Reg 17) OR 1.2 Licence to take fauna for educational or public purposes (Reg 15)	Provide SC (DEC personnel only) or SF licence number Provide TF licence number
Animal handling and processing skills/experience	7.1 Experience in handling terrestrial mammal fauna OR 7.2 Experience in handling terrestrial herpetofauna OR 7.3 Experience in handling birds AND (if relevant to project) 7.11 Training and experience in translocating fauna – identify species. AND (if relevant to project) 7.13 Training and experience in the keeping of fauna for subsequent vouchering.	Personnel involved in transport and temporary containment of wildlife should be familiar with the normal behaviour patterns of the species that is to be retained. They should be familiar with the most appropriate containment methods for the species of interest to the project. This experience is best obtained under supervision of more experienced personnel. Estimated total time in field: Minimum 2-5 years involved in similar projects

9 Occupational Health and Safety

Always carry a first aid kit in your vehicle and be aware of your own safety and the safety of others as well as the animals when handling.

It is recommended that a job safety analysis is undertaken prior to undertaking transport or temporary holding of wildlife for your project. This safety analysis should include the following considerations where relevant.

9.1 Driver fatigue

Driver fatigue is a concern when animals are being transported for translocation by road. Often drivers have been involved in trapping the animals and therefore may have worked long hours and had interrupted sleep. There are also long distances involved in some translocations which increase the risk of driver fatigue. Appropriate measures, such as regular rest stops or back-up drivers, should be utilised to minimise the risk of driver fatigue.

9.2 Containment of animals

It is important that the animals do not escape during travel and cause problems for the driver/pilot during transport. It is also important that the containers for the animals are stowed securely so that they do not move during transport.

9.3 Venomous or dangerous animals

Ensure containers holding venomous or dangerous animals are escape proof and clearly labelled, “Danger – Venomous Animal”.

10 Further Reading

The following SOPs have been mentioned in the advice regarding transport and temporary containment of wildlife. It is recommended that the following SOPs are also considered when proposing to undertake transport and temporary containment of wildlife.

SOP 10.1 Animal handling/restraint using soft containment

Wildlife Ethics Committee (2005) and Charles Darwin University Animal Ethics Committee (2006) also provide advice on the temporary containment and transportation of live animals.

11 References

Chapman, T., Sims, C. and Mawson, P. (2008). Minimising Disease Risk in Wildlife Management. Standard Operating procedures for fauna translocation, monitoring and euthanasia in the field. 2nd edition. Department of Environment and Conservation, Perth.

Charles Darwin University Animal Ethics Committee (2006). Guidelines for Field Research on Vertebrates. Charles Darwin University, Northern Territory.

NHMRC (2004). Australian code of practice for the care and use of animals for scientific purposes. National Health and Medical Research Council, Commonwealth of Australia 7th Edition.

Wildlife Ethics Committee (2005). Standard operating procedure for the transportation of live animals. South Australian Department for Environment and Heritage.

Appendix 4

Northern Quoll monitoring program

NORTHERN QUOLL MONITORING PROGRAM

The Northern Quoll (*Dasyurus hallucatus*) has been recorded at site MW-F-3 in rocky ridge and gorge habitat during the autumn 2010 survey. The presence of scats at five other locations in the study area, also within rocky ridge and gorge habitat, suggests the species is present throughout this habitat within the study area. As such, Atlas is committed to implementing the following monitoring program.

1 Overview

This monitoring program aims to document changes to Northern Quoll populations during the life of the Project and to assess the effectiveness of Atlas' management commitments.

This monitoring program will include:

- Baseline population survey (completed, Outback Ecology 2012): A level 2 terrestrial fauna survey (autumn and spring 2010) has investigated the Northern Quoll population within the Project area.
- Annual monitoring: The aim of this program is to track population trends during the life of the Project.
- Opportunistic monitoring: The aim of this program is to provide additional data and information collected by site personnel to supplement the annual monitoring program, and to generate interest amongst site personnel in the protection of the Northern Quoll.

2 Monitoring Method

A fauna specialist will coordinate the monitoring program and it is envisaged that it will be coincident with the conduct of the Pilbara Leaf-nosed Bat monitoring program. Permanent monitoring sites will be established in Rocky Ridges and Gorges habitat, based on the baseline survey conducted by Outback Ecology in 2010 (Outback Ecology 2012). Additional monitoring sites will be established in rehabilitated areas to determine re-colonisation trends and rehabilitation effectiveness.

Survey methodology will be modelled on those methods successfully implemented as part of existing monitoring programs at other Atlas sites (e.g. Wodgina, Abydos, Mt Dove) and will be in accordance with relevant guidelines and standards. Capture-recapture trapping locations will be recorded and maintained in a GPS database, with monitoring to be conducted between May and August minimising the risk of heat stress by trapping during cooler months, yet early enough to not interfere with breeding and subsequent die off.

Parameters to be collected include, but are not limited to; sex, age, reproductive condition (e.g. females with distended pouch or extended teats), weight, tail diameter and pes (left hind foot) length.

Genetic material for all Northern Quoll captures will be collected and forwarded to the Department of Environment and Conservation (DEC). Additionally, scat and track searches in the vicinity of trapping locations will also be performed opportunistically to complement data obtained via trapping.

APPENDIX 4

3 Reporting

The following reports will be prepared:

- Fauna Specialist Report: the Fauna Specialist will produce a stand alone report at the conclusion of each annual monitoring period. This report will include the following sections; methods, results, discussion and recommendations. This report will also be appended to Atlas' annual environment report (AER).
- Annual monitoring: Results will be discussed in Atlas' AER. Should annual monitoring identify discernable Northern Quoll population trends then corrective management measures, if necessary, will be presented in the AER. The AER will be forwarded to relevant Commonwealth and State agencies within three months of completion or in accordance with legal requirements.
- Opportunistic monitoring: Northern Quoll sightings (including scats and tracks), injuries and mortalities will be reported to the Site Environmental Advisor. All records will be entered into a site database and summaries will be included in the AER.

4 Performance Criteria and Corrective Actions

Performance criteria for the Northern Quoll have been provided in the SSMP. Should this monitoring program indicate that these performance criteria are not being met, then corrective actions will be implemented.

5 References

Outback Ecology. 2012. Mt Webber DSO Project - Terrestrial vertebrate fauna impact assessment. Unpublished report Prepared by Outback Ecology Services for Atlas Iron Limited, Perth, Western Australia.

Appendix 5

Pilbara leaf-nosed Bat monitoring program

PILBARA LEAF-NOSED BAT MONITORING PROGRAM

The Pilbara Leaf-nosed Bat (*Rhinonictis aurantia*) has been recorded at various sites within Project and study areas. Cave MW-AN-27 has been identified as a significant day time roost for these species. This cave lies approximately 500 m north of the application area and will not be directly impacted by the Project. Additionally, suitable caves and habitat within the Project area were identified as being used regularly by Pilbara Leaf-nosed Bats for foraging and sheltering (Outback Ecology, 2012). As such, Atlas is committed to implementing the following monitoring program.

1 Overview

This monitoring program aims to document changes to Pilbara Leaf-nosed Bat populations during the life of the Project and to assess the effectiveness of Atlas' management commitments.

This monitoring program will include:

- Baseline population survey (completed, Outback Ecology 2012): A level 2 terrestrial fauna survey (autumn and spring 2010) and a targeted survey of significant caves (autumn 2012) have investigated the Pilbara Leaf-nosed Bat populations within the Project area.
- Annual monitoring: The aim of this program is to track bat activity levels within significant caves during the life of the Project.
- Opportunistic monitoring: The aim of this program is to provide additional data and information collected by site personnel to supplement the annual monitoring program, and to generate interest amongst site personnel in the protection of the Pilbara Leaf-nosed Bat.

2 Monitoring Method

A fauna specialist will coordinate the monitoring program and it is envisaged that it will be coincident with the conduct of the Northern Quoll monitoring program. Permanent monitoring sites will be established at locally and regionally significant bat roosts within rocky ridges and gorges habitat, based on the baseline and targeted surveys conducted by Outback Ecology in 2010 and 2012 (Outback Ecology 2012). This will include both control and impact sites, in an attempt to detect any response of these species to impacts from the Project. Cave MW-AN-27, which has been defined as a regionally significant day time roost for the Pilbara Leaf-nosed Bat will be monitored as part of the program. Monitoring will be conducted on an annual basis during construction and operations for the life of the Project (including rehabilitation).

Survey methodology will be modelled on those methods successfully implemented as part of existing monitoring programs at other Atlas sites (e.g. Wodgina and Abydos) and will be in accordance with relevant guidelines and standards. Monitoring will be conducted during the winter, which represents a drier period when bats are more likely to utilise roosts as refugia for the provision of a humid microclimate.

Parameters to be collected include, but are not limited to:

- Presence, relative abundance and patterns of activity within significant bat roosts.
- Roost characteristics and condition (for example, rock falls, cracking etc).
- Noise and vibration levels (where mining activity comes within close proximity to any significant roosts, i.e. within 100 m of MW-AN-27). Monitoring of these parameters may occur separately to the scheduled annual monitoring program on an as needs basis.

APPENDIX 5

- Presence and/or the impact of artificial light sources.
- Bat behaviour in response to noise, vibration and light emissions (on an as needs basis in line with the two points above).

Monitoring techniques may include, but will not be limited to physical inspections, acoustic recording, bat counts and photographic records. Noise, vibration and illumination monitoring equipment may be used, where appropriate. Results will be analysed using recognised biological and statistical methods and standards.

3 Reporting

The following reports will be prepared:

- Fauna Specialist Report: the Fauna Specialist will produce a stand alone report at the conclusion of each annual monitoring period. This report will include the following sections: methods, results, discussion and recommendations. This report will also be appended to Atlas' annual environment report (AER).
- Annual monitoring: Results will be discussed in Atlas' AER. Should annual monitoring identify discernable trends in distribution, patterns of activity or changes in physical attributes of bat roosts, then corrective management measures, if necessary, will be presented in the AER. The AER will be forwarded to relevant Commonwealth and State agencies within three months of completion or in accordance with legal requirements.
- Opportunistic monitoring: Pilbara Leaf-nosed Bat sightings, injuries and mortalities will be reported to the Environmental Officer – Mt Webber operations. All records will be entered into a site database and summaries will be included in the AER.
- Rehabilitation monitoring: As per annual monitoring reporting.

4 Performance Criteria and Corrective Actions

Performance criteria for the Pilbara Leaf-nosed Bat have been provided in the SSMP. Should this monitoring program indicate that these performance criteria are not being met, then corrective actions will be implemented.

5 References

Outback Ecology. 2012. Mt Webber DSO Project - Terrestrial vertebrate fauna impact assessment. Unpublished report Prepared by Outback Ecology Services for Atlas Iron Limited, Perth, Western Australia.