



**bhpbilliton**

resourcing the future

Appendix A6  
Significant Species Terrestrial Management Plan





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## SIGNIFICANT TERRESTRIAL SPECIES MANAGEMENT PLAN

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### 1 INTRODUCTION

#### 1.1 PROJECT OVERVIEW

BHP Billiton Iron Ore is seeking parallel approval under the State *Environmental Protection Act 1986* (EP Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to undertake the Outer Harbour Development, located in Port Hedland, Western Australia.

The Outer Harbour Development will provide an export capacity of approximately 240 million tonnes per annum (Mtpa) of iron ore. This will be established in four stages, with incremental expansions brought on line to reach the maximum capacity. Expansion stages will occur through four separate modules, each with a nominal capacity of up to 60 Mtpa. Regulatory approvals are being sought for the infrastructure required to deliver the total capacity of 240 Mtpa.

The Outer Harbour Development will involve the construction and operation of landside and marine infrastructure for the handling and export of iron ore. Landside development will include:

- rail connections and spur from the existing BHP Billiton Iron Ore mainline to proposed stockyards at Boodarie;
- rail loops at Boodarie;
- stockyards at Boodarie; and
- an infrastructure corridor (including conveyors, access roadway and utilities) from the stockyards to the proposed marine jetty.

**Figure 1.1** shows the location of the Outer Harbour Development, including proposed infrastructure and the proposed disturbance envelope.

#### 1.2 PLAN OBJECTIVES

##### 1.2.1 Overarching Objectives

The objective of this Significant Terrestrial Species Management Plan (STSMP) is to assist BHP Billiton Iron Ore and its contractors in the implementation of appropriate flora and fauna management measures and reporting procedures for significant terrestrial flora and fauna species during the construction of the Outer Harbour Development.

Other key objectives of this management plan are listed as follows:

- Describes the existing environmental values identified within the Project study area;
- Details the management actions and strategies that will be implemented to minimise potential impacts to significant species and / or habitat during terrestrial construction; and
- Outlines the monitoring, inspection, reporting, and management plan review programs that will be implemented during the works.

Separate management plans will be developed for the management of significant marine flora and fauna. Where there is any conflict between the provisions of this STSMP and a contractor's obligation under the relevant contract, including the various statutory requirements (i.e. licences, permits, consent conditions and relevant laws), the contract and statutory requirements are to take precedence. In the case of any real or perceived ambiguity between elements of this STSMP and the above statutory requirements the contractor shall first request clarification from BHP Billiton Iron Ore prior to implementing that element of this STSMP over which the ambiguity is identified.

##### 1.2.2 Terrestrial Flora and Vegetation Objectives

The management objectives for terrestrial flora and vegetation are:

- to maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge, and to protect Declared Rare Flora and Priority Flora, consistent with the provisions of the WC Act; and

- meet statutory requirements and acceptable standards.

### 1.2.3 Terrestrial Fauna Objectives

The management objectives that will be applied to the environmental factor of terrestrial fauna are to:

- maintain the abundance, diversity, geographic distribution and productivity of fauna species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge;
- provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance; and
- meet statutory requirements and acceptable standards.

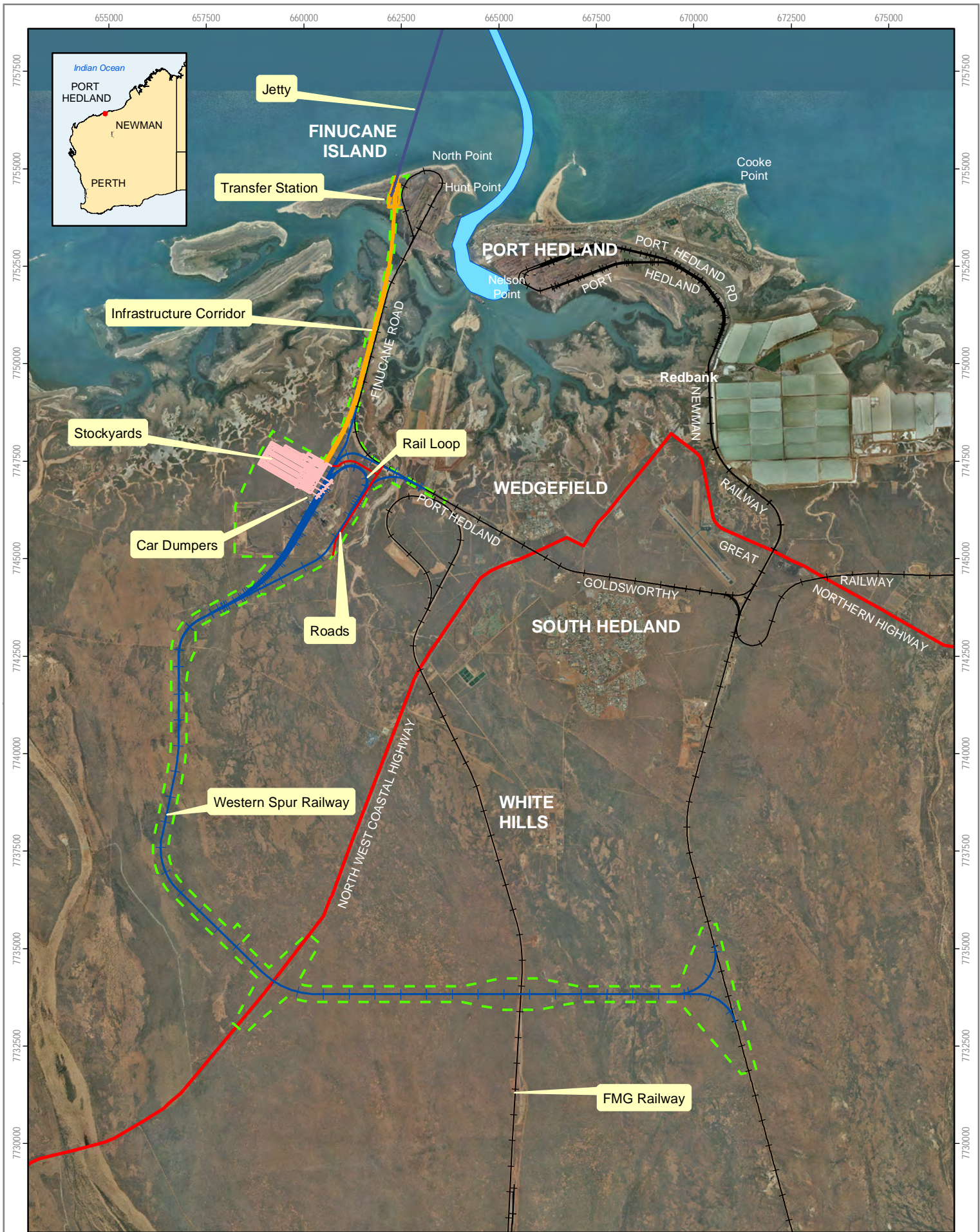
### 1.3 LEGAL REQUIREMENTS AND GUIDELINES

The management measures contained within this STSMP have been developed in accordance with the relevant provisions of the EP Act, the WA *Wildlife Conservation Act, 1950* (WC Act) and the EPBC Act. The WA Department of Environment and Conservation (DEC) and the Commonwealth Department of Environment, Heritage, Water and the Arts (DEHWA) are the relevant administering authorities of these Acts, respectively. An overview of the provision of these Acts which are relevant to the Outer Harbour Development is provided below. It should be noted that the information presented is intended only to provide a summary of the subject matter covered. It does not purport to be comprehensive or to render legal advice.

#### ***WA Environmental Protection Act, 1986***

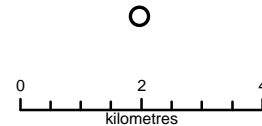
The EP Act provides for the establishment of the Environmental Protection Authority (EPA), which has the objective of overseeing the prevention, control and abatement of pollution and environmental harm, and the conservation, preservation, protection, enhancement and management of the environment. The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





**Legend**

- |  |                            |  |                                  |  |                               |
|--|----------------------------|--|----------------------------------|--|-------------------------------|
|  | Proposed Departure Channel |  | Proposed Wharf                   |  | Principal Road                |
|  | Existing Shipping Channel  |  | Proposed Infrastructure Corridor |  | Proposed Western Spur Railway |
|  | Proposed Jetty             |  | Proposed Stockyards              |  | Existing Railways             |
|  |                            |  | Disturbance Envelope             |  |                               |



Datum: GDA94  
Map Grid: MGA94 Zone 50



Source:  
Orthorectified Aerial Photograph:  
06/2008 (BHPBIO)  
Topography: Geoscience Australia,  
GEODATA Topo 250K V3  
360lg427\_WV03716\_Rev1

Figure 1.1 Project Location



## SIGNIFICANT TERRESTRIAL SPECIES MANAGEMENT PLAN

Part IV of the EP Act establishes provisions for the EPA to carry out Environmental Impact Assessments (EIA) in WA. Where relevant, the EPA issues and directs proponents to comply with Guidance Statements that contain the EPA's minimum requirements for the protection of elements of the environment such as flora and fauna. Guidance Statement 51 – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia and Guidance Statement 56 – Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia require proponents to assess flora and fauna of conservation significance in their EIA.

The Outer Harbour Development Public Environmental Review/Environmental Impact Statement (PER/EIS) document (BHP Billiton Iron Ore 2009) assessed the impacts associated with the construction of the Outer Harbour Development on flora and fauna in accordance with EPA Guidance Statements 51 and 56.

Commitments were made within the Outer Harbour Development PER/EIS document to manage impacts involving significant terrestrial species. This STSMP forms the framework for minimising and managing impacts to significant terrestrial species. Following the EPA's assessment of the proposed Outer Harbour Development, conditions imposed by the EPA in relation to management of significant species will be adopted in a revised version of this STSMP.

### ***Wildlife Conservation Act, 1950***

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

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

### ***Environment Protection and Biodiversity Conservation Act, 1999***

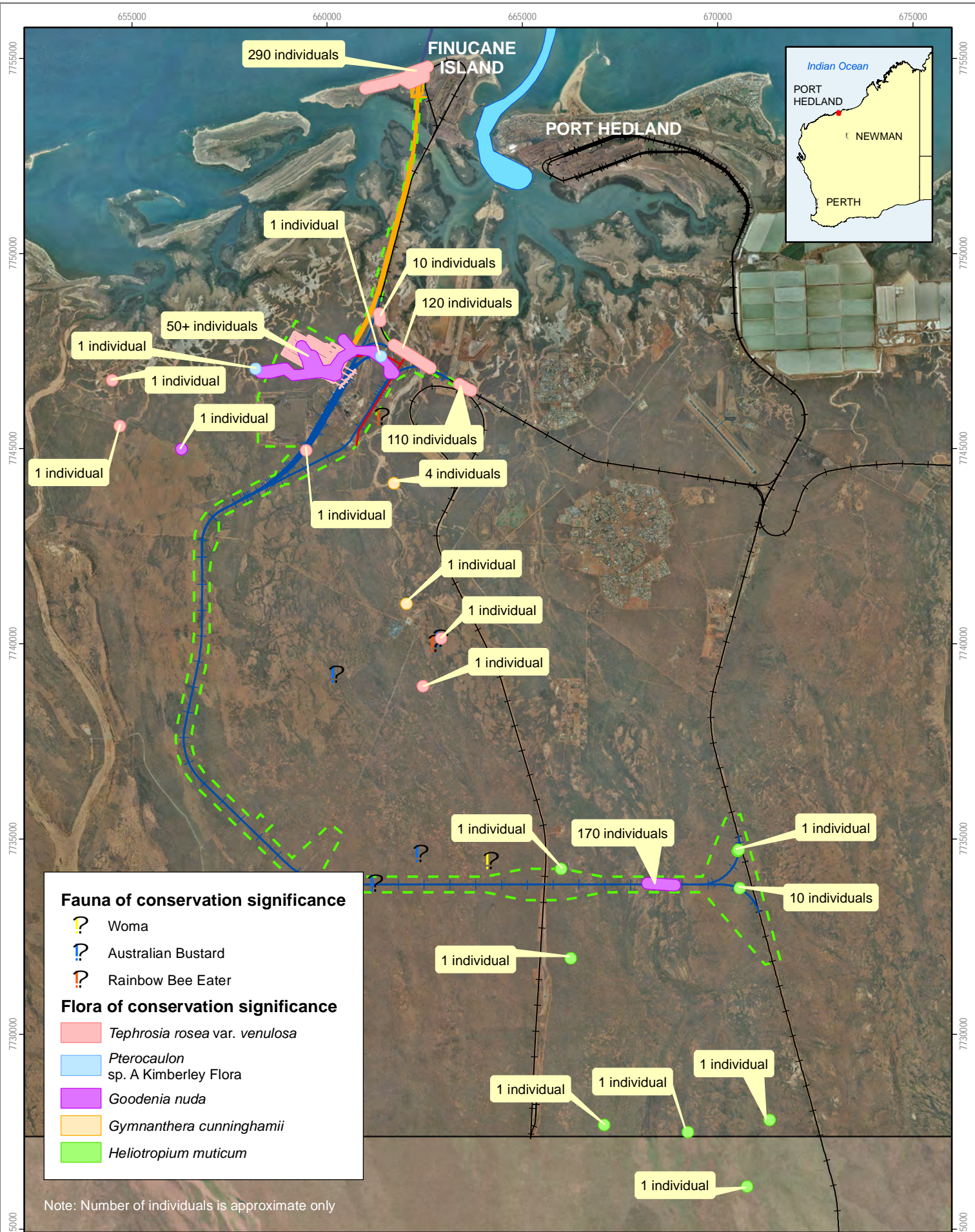
The Commonwealth EPBC Act contains a list of flora and fauna species that are nominated as being of 'National Environmental Significance'. The list is divided into groups according to conservation status (**Appendix A.1**). The EPBC Act also provides for the protection of migratory bird species listed in the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals), the Agreement between the Government of Australia and the Government of the Peoples Republic of China for the Protection of Migratory Birds and their Environment (CAMBA), the Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA) and the Agreement between the Republic of Korea and the Government of Australia for the Protection of Migratory Birds (ROKAMBA).

## **1.4 SUMMARY OF KEY ISSUES COVERED BY THIS PLAN**

This plan covers significant terrestrial flora and fauna species and excludes fauna which utilise marine habitats (e.g. tidal flats, mangroves and samphires) such as shorebirds and seabirds. Three significant terrestrial fauna species and five significant flora species have been recorded at the proposed Outer Harbour Development (**Figure 1.2**). An additional 15 significant species may potentially occur. Impacts to significant flora are likely to be restricted to the construction phase during vegetation clearing whereas impacts to fauna are likely to continue into the operation phase and will depend on the mobility or seasonality of the fauna involved. During construction of the development, impacts will be focussed within a disturbance envelope (**Figure 1.1**).

A three level management hierarchy (**Table 1.1**) has been developed by BHP Billiton Iron Ore to broadly classify and assign the appropriate level of management response for significant flora and fauna species at the Outer Harbour Development. This STSMP describes how the management hierarchy is to be implemented.





**Figure 1.2 Location of Significant Species**

Scale @ A4: 1:125,000  
 Datum: GDA94  
 Map Grid: MGA94 Zone 50

Source:  
 Orthorectified Aerial Photograph: 06/2008 (BHPBIO)  
 Landsat: 2005  
 Topography: Geoscience Australia, GEODATA Topo 250K V3 (Copyright Commonwealth of Australia, 2006)  
 Flora: ENV (2007 - 2009)

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**Table 1.1 – BHP Billiton Iron Ore Management Hierarchy for Significant Species at the Outer Harbour Development**

	Level of Significant Species		
	1	2	3
<b>Summary of Category</b>	Species recorded at the Outer Harbour Development and likely to be impacted in the next five years (i.e. 2009 – 2014).	Species recorded at the Outer Harbour Development and unlikely to be impacted in the next five years (i.e. 2006 – 2011).	Species not previously identified at the Outer Harbour Development but suitable habitat is available and therefore could potentially occur.
<b>Summary of Level of Management Required</b>	Implement higher level specific management plans and monitoring ( <b>Section 5.1</b> ), plus general environmental management measures and monitoring ( <b>Section 4</b> ).	Implementation of specific monitoring required ( <b>Section 5.2</b> ), plus general environmental management measures and monitoring ( <b>Section 4</b> ).	Implementation of general environmental management measures and monitoring ( <b>Section 4</b> ).
<b>Species Currently in Category</b>	<ul style="list-style-type: none"> <li>• <i>Goodenia nuda</i></li> <li>• <i>Heliotropium muticum</i></li> <li>• <i>Pterocaulon</i> sp. A Kimberley Flora (B. J. Carter 599)</li> <li>• <i>Tephrosia rosea</i> var. <i>venulosa</i></li> <li>• Brush-tailed Mulgara</li> <li>• Woma Python</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Gymnanthera cunninghamii</i></li> <li>• Australian Bustard</li> <li>• Rainbow Bee-eater</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Acacia glaucocaesia</i></li> <li>• <i>Bulbostylis burbridgeae</i></li> <li>• <i>Crotalaria spectabilis</i> subsp. <i>spectabilis</i></li> <li>• <i>Euphorbia clementii</i></li> <li>• <i>Gomphrena pusilla</i></li> <li>• <i>Mimulus clementii</i></li> <li>• <i>Ptilotus appendiculatus</i> var. <i>minor</i></li> <li>• Blind Snake</li> <li>• Bush Stone-curlew</li> <li>• Ghost Bat</li> <li>• Grey Falcon</li> <li>• Lakeland Downs Mouse</li> <li>• Pilbara Leaf-nosed Bat</li> <li>• Peregrine Falcon</li> <li>• Star Finch</li> </ul>

It should be noted that the management hierarchy shown above is intended for internal use by BHP Billiton Iron Ore and its contractors at the Outer Harbour Development. The category assigned to each species will change, as changes in species records, the conservation significance (as listed by the WC Act or EPBC Act) or BHP Billiton Iron Ore's planned activities at the Outer harbour Development require a change to the level of management response.

This STSMP will be reviewed and updated periodically to reflect changes to the legislation and/or guidance statements, and construction requirements of this project at intervals of up to three years (see **Section 1.2**). The level of management response assigned to species of conservation significance will be reviewed as part of this process. Where one or more of the management measures described in this STSMP are insufficient to manage the potential impact, a review of the measure(s) will be conducted and alternative (i.e. contingency) control strategies will be implemented where necessary.

BHP Billiton has developed and implemented an Environmental Management System (EMS) for all operations that is certified to Australian Standard AS/NZS ISO 14001:1996. The EMS describes the organisation structure, responsibilities, practices, processes and resources for implementing and maintaining environmental objectives at all BHP Billiton sites. This system will be implemented for the Outer Harbour Development.



## SIGNIFICANT TERRESTRIAL SPECIES MANAGEMENT PLAN

### 1.5 STRUCTURE OF THIS PLAN

The following sections provide an overview of the previous flora and fauna surveys undertaken at the Outer Harbour Development (**Section 2**), locations of recorded significant species (**Section 3**), general environmental management measures to be implemented during construction and operation of the Outer Harbour Development (**Section 4**), and the specific management measures that are to be used for species of conservation significance (**Section 5**).

### 1.6 SUMMARY OF EXISTING SURVEY INFORMATION

Several recent baseline surveys, impact assessments and studies have been conducted to document and monitor the vegetation associations, flora and fauna within the Outer Harbour Development project area. Baseline surveys undertaken for the Goldsworthy Rail Duplication also encompassed a small portion of the Outer Harbour Development project area. The baseline surveys included:

- ENV 2009a *Outer Harbour Development Flora and Vegetation Assessment*. An unpublished report for BHP Billiton Iron Ore.
- ENV 2009b *Goldsworthy Rail Duplication Flora and Vegetation Assessment*. An unpublished report for BHP Billiton Iron Ore.
- ENV 2009c *Outer Harbour Development Fauna Assessment*. An unpublished report for BHP Billiton Iron Ore.
- ENV 2009d *Goldsworthy Rail Duplication Fauna Assessment*. An unpublished report for BHP Billiton Iron Ore.
- ENV 2009e *Outer Harbour Development and Goldsworthy Rail Duplication Short-range Endemic Fauna Assessment*. An unpublished report for BHP Billiton Iron Ore.

A Priority Flora Search was also undertaken by ENV in March 2009 following a period of rainfall considered to be sufficient to promote the germination of annual species:

- ENV 2009f *Port Hedland Area Priority Flora Targeted Survey*. An unpublished report for BHP Billiton Iron Ore.

### 1.7 FLORA

In a regional context, the Outer Harbour Development is situated in the Abydos Plain, which forms part of the Fortescue Botanical District in the Eremaean Botanical Province of Western Australia, as per Beard (1975). The Fortescue Botanical District is characterised by tree and shrub steppes with some short grass savannahs on the coast.

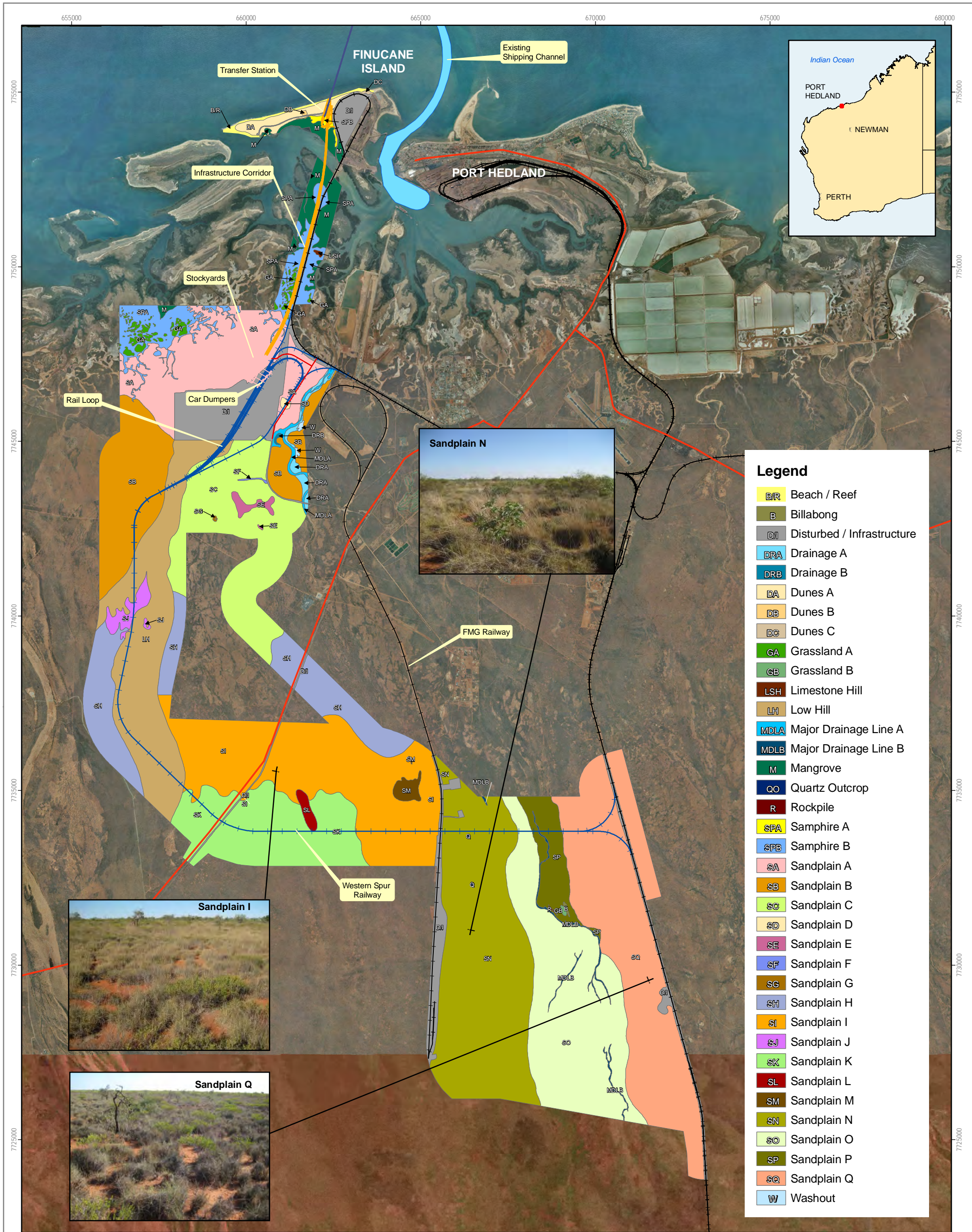
A total of 394 taxa (including species, subspecies and variants) have been recorded within the Outer Harbour Development (ENV 2009a, 2009b). The most common families recorded have been Poaceae, Papilionaceae and Mimosaceae. The most commonly recorded genera were *Acacia* and *Sida*.

Thirty-four vegetation communities (excluding areas devoid of native vegetation such as disturbed areas, beach/reef or washout) have been mapped for the Outer Harbour Development (ENV 2009a, 2009b). These vegetation communities are shown in **Figure 2.1**. The key characteristics of each community are provided in **Table 1.2**.

Disturbed areas devoid of native vegetation are also present within the Outer Harbour Development.

Flora species of conservation significance that have been recorded at the Outer Harbour Development to date are listed in **Section 3** and shown in **Figure 1.2**.





- Legend**
- Existing Shipping Channel
  - Proposed Jetty
  - Proposed Wharf
  - Proposed Infrastructure Corridor
  - Proposed Stockyards
  - Principal Road
  - Proposed Roads
  - Proposed Western Spur Railway
  - Existing Railways

0 1 2  
kilometres  
Scale = 1:100,000 at A3  
Datum: GDA94  
Projection: MGA94 Zone 50



Source:  
Vegetation Types (ENV 2008a)  
Orthorectified Aerial Photograph: 08/06/2008 (BHPBIO)  
Imagery: Landsat  
Topography: Geoscience Australia, GEODATA Topo  
250K V3.

Figure 2.1 Vegetation Communities Recorded in the Survey Area



## SIGNIFICANT TERRESTRIAL SPECIES MANAGEMENT PLAN

Table 1.2 – Summary of Vegetation Communities at the Outer Harbour Development

Vegetation Community	Vegetation Description	Vegetation Condition
Mangroves	A high closed <i>Ceriops tagal</i> and <i>Avicennia marina</i> shrubland.	Very Good to Excellent
Dunes A	Scattered <i>Acacia bivenosa</i> shrubs over a low open <i>Crotalaria cunninghamii</i> shrubland over a * <i>Cenchrus ciliaris</i> tussock grassland over scattered * <i>Aerva javanica</i> herbs.	Very Good to Excellent
Dunes B	An <i>Atalaya hemiglauca</i> , <i>Santalum lanceolatum</i> and <i>Acacia bivenosa</i> shrubland over a * <i>Cenchrus ciliaris</i> tussock grassland.	Good
Dunes C	A low open <i>Acacia stellaticeps</i> , <i>Acacia bivenosa</i> and <i>Acacia ampliceps</i> shrubland over a <i>Spinifex longifolius</i> and * <i>Cenchrus ciliaris</i> open grassland over scattered <i>Gomphrena canescens</i> herbs.	Very Good
Samphire A	Scattered <i>Avicennia marina</i> shrubs over a low open <i>Halosarcia halocnemoides</i> subsp. <i>tenuis</i> , <i>Halosarcia halocnemoides</i> and <i>Trianthema turgidifolia</i> shrubland.	Very Good
Samphire B	Scattered <i>Avicennia marina</i> shrubs over a low open <i>Halosarcia halocnemoides</i> , <i>Threlkeldia diffusa</i> and <i>Halosarcia pterygosperma</i> subsp. <i>denticulata</i> shrubland over a very open <i>Eragrostis falcata</i> tussock grassland.	Very Good
Limestone Hill	An <i>Acacia bivenosa</i> and <i>Hakea lorea</i> subsp. <i>lorea</i> shrubland over scattered low <i>Rhagodia eremaea</i> and <i>Scaevola spinescens</i> shrubs over a scattered <i>Eriachne obtusa</i> tussock grasses.	Good to Very Good
Grassland A	<i>Triodia secunda</i> and <i>Triodia epactia</i> hummock grassland.	Very Good
Grassland B	<i>Triodia epactia</i> hummock grassland.	Good
Low Hill	An <i>Acacia tumida</i> var. <i>pilbarensis</i> shrubland over a low <i>Acacia stellaticeps</i> shrubland over a <i>Triodia epactia</i> hummock grassland.	Very Good to Excellent
Major Drainage Line A	Scattered low <i>Eucalyptus victrix</i> trees over a high open <i>Melaleuca argentea</i> , <i>Acacia ampliceps</i> and <i>Acacia trachycarpa</i> shrubland over scattered <i>Adriana urticoides</i> var. <i>urticoides</i> and <i>Pluchea ferdinandi-muelleri</i> shrubs over an open <i>Triodia epactia</i> hummock grassland.	Very Good
Major Drainage Line B	A low open <i>Eucalyptus victrix</i> woodland over an <i>Acacia tumida</i> var. <i>pilbarensis</i> and <i>Acacia coleii</i> var. <i>coleii</i> shrubland over a very open <i>Triodia epactia</i> hummock grassland.	Very Good
Quartz Outcrop	Scattered low <i>Ficus brachypoda</i> , <i>Cleorodendrum tomentosum</i> var. <i>lanceolatum</i> and <i>Carissa lanceolata</i> trees over scattered herbs.	Good
Billabong	Scattered low <i>Eucalyptus victrix</i> trees over scattered mixed grasses.	Good
Rockpile	Scattered low <i>Ficus brachypoda</i> , <i>Cleorodendrum tomentosum</i> var. <i>lanceolatum</i> and <i>Carissa lanceolata</i> trees over scattered herbs.	Good
Drainage A	A low open <i>Eucalyptus victrix</i> woodland over a high open <i>Acacia ampliceps</i> and <i>Acacia trachycarpa</i> shrubland over a low open <i>Acacia stellaticeps</i> , <i>Pluchea ferdinandi-muelleri</i> and <i>Corchorus incanus</i> subsp. <i>incanus</i> shrubland over a <i>Triodia epactia</i> hummock grassland over an <i>Aristida holathera</i> var. <i>latifolia</i> , <i>Eriachne obtusa</i> and * <i>Cenchrus ciliaris</i> tussock grassland.	Good to Very Good
Drainage B	A low open <i>Eucalyptus victrix</i> woodland over a high open <i>Acacia ampliceps</i> shrubland over a low open <i>Acacia stellaticeps</i> and <i>Pluchea ferdinandi-muelleri</i> shrubland over a closed <i>Triodia epactia</i> and <i>Triodia secunda</i> hummock grassland over an open <i>Eriachne obtusa</i> , <i>Aristida holathera</i> var. <i>latifolia</i> and * <i>Cenchrus ciliaris</i> tussock grassland.	Very Good
Sandplain A	Low <i>Acacia stellaticeps</i> shrublands over <i>Triodia epactia</i> and <i>Triodia secunda</i> hummock grasslands/ <i>Triodia epactia</i> and <i>Triodia secunda</i> hummock grasslands mosaic.	Very Good to Excellent
Sandplain B	An open <i>Acacia coleii</i> var. <i>coleii</i> shrublands over low <i>Acacia stellaticeps</i> shrublands over <i>Triodia epactia</i> and <i>Triodia secunda</i> hummock grasslands/low <i>Acacia stellaticeps</i> shrublands over <i>Triodia epactia</i> and <i>Triodia secunda</i> hummock grasslands mosaic.	Very Good to Excellent



## SIGNIFICANT TERRESTRIAL SPECIES MANAGEMENT PLAN

Vegetation Community	Vegetation Description	Vegetation Condition
Sandplain C	A low open <i>Corymbia flavescens</i> woodland over an open <i>Acacia colei</i> var. <i>colei</i> shrubland over a low <i>Acacia stellaticeps</i> shrubland over a <i>Triodia epactia</i> hummock grassland/ low <i>Acacia stellaticeps</i> shrublands over <i>Triodia epactia</i> and <i>Triodia secunda</i> hummock grasslands/ <i>Triodia epactia</i> and <i>Triodia secunda</i> hummock grasslands mosaic.	Very Good to Excellent
Sandplain D	A low <i>Eucalyptus victrix</i> woodland over an <i>Acacia colei</i> var. <i>colei</i> shrubland over a low open <i>Acacia stellaticeps</i> and <i>Pluchea tetranthera</i> shrubland over a <i>Triodia epactia</i> hummock grassland.	Very Good
Sandplain E	A low open <i>Corymbia flavescens</i> and <i>Eucalyptus victrix</i> woodland over an <i>Acacia colei</i> var. <i>colei</i> and <i>Acacia sericophylla</i> shrubland over a low open <i>Acacia stellaticeps</i> shrubland over a <i>Triodia epactia</i> hummock grassland.	Excellent
Sandplain F	An open <i>Acacia tumida</i> var. <i>pilbarensis</i> and <i>Acacia colei</i> var. <i>colei</i> shrubland over an open <i>Triodia epactia</i> hummock grassland.	Good
Sandplain G	A low open <i>Corymbia flavescens</i> woodland over an <i>Acacia colei</i> var. <i>colei</i> , <i>Carissa lanceolata</i> and <i>Acacia sericophylla</i> shrubland over a <i>Triodia epactia</i> hummock grassland over a very open * <i>Cenchrus ciliaris</i> , <i>Chrysopogon fallax</i> and <i>Eriachne obtusa</i> tussock grassland.	Excellent
Sandplain H	An <i>Acacia tumida</i> var. <i>pilbarensis</i> and <i>Acacia colei</i> var. <i>colei</i> shrubland over a low <i>Acacia stellaticeps</i> shrubland over a <i>Triodia epactia</i> hummock grassland/ low <i>Acacia stellaticeps</i> shrubland over a <i>Triodia epactia</i> hummock grassland mosaic.	Very Good to Excellent
Sandplain I	An <i>Acacia tumida</i> var. <i>pilbarensis</i> shrubland over a low <i>Acacia stellaticeps</i> shrubland over a <i>Triodia epactia</i> hummock grassland/ low <i>Acacia stellaticeps</i> shrubland over a <i>Triodia epactia</i> hummock grassland/ <i>Triodia epactia</i> hummock grassland mosaic.	Excellent
Sandplain J	Scattered low <i>Corymbia flavescens</i> trees over an open <i>Acacia tumida</i> var. <i>pilbarensis</i> shrubland over a low open <i>Acacia stellaticeps</i> shrubland over a <i>Triodia epactia</i> and <i>Triodia secunda</i> hummock grassland/ <i>Triodia secunda</i> and <i>Triodia epactia</i> hummock grassland mosaic.	Very Good to Excellent
Sandplain K	Scattered low <i>Owenia reticulata</i> trees over an <i>Acacia tumida</i> var. <i>pilbarensis</i> and <i>Acacia colei</i> var. <i>colei</i> shrubland over a low <i>Acacia stellaticeps</i> shrubland over a <i>Triodia epactia</i> hummock grassland/low <i>Acacia stellaticeps</i> shrubland over a <i>Triodia epactia</i> hummock grassland mosaic.	Excellent
Sandplain L	A low open <i>Corymbia zygophylla</i> woodland over an open <i>Acacia colei</i> var. <i>colei</i> , <i>Acacia inaequilatera</i> and <i>Acacia ancistrocarpa</i> shrubland over a low <i>Acacia sericophylla</i> , <i>Acacia stellaticeps</i> , <i>Senna artemisioides</i> aff. subsp. <i>oligophylla</i> (thinly sericeous) and <i>Dodonaea coriacea</i> shrubland over a very open <i>Triodia lanigera</i> and <i>Triodia epactia</i> hummock grassland	Excellent
Sandplain M	An open <i>Acacia ancistrocarpa</i> , <i>Acacia tumida</i> var. <i>pilbarensis</i> and <i>Acacia inaequilatera</i> shrubland over a <i>Triodia lanigera</i> hummock grassland.	Very Good to Excellent
Sandplain N	A low open <i>Corymbia zygophylla</i> woodland over an open <i>Acacia ancistrocarpa</i> , <i>Acacia inaequilatera</i> , <i>Acacia tumida</i> var. <i>pilbarensis</i> and <i>Acacia sericophylla</i> shrubland over <i>Acacia stellaticeps</i> low open shrubland over <i>Triodia epactia</i> and <i>Triodia lanigera</i> hummock grassland.	Excellent
Sandplain O	Scattered low <i>Eucalyptus victrix</i> and <i>Corymbia hamersleyana</i> trees over an open <i>Acacia ancistrocarpa</i> , <i>Acacia tumida</i> var. <i>pilbarensis</i> , <i>Acacia inaequilatera</i> and <i>Acacia trudgeniana</i> shrubland over a low open <i>Acacia stellaticeps</i> shrubland over a <i>Triodia epactia</i> and <i>Triodia lanigera</i> hummock grassland.	Excellent
Sandplain P	A low open <i>Eucalyptus victrix</i> , <i>Corymbia hamersleyana</i> and <i>Corymbia flavescens</i> woodland over an open <i>Acacia colei</i> var. <i>colei</i> shrubland over a low open <i>Acacia stellaticeps</i> and <i>Pluchea tetranthera</i> shrubland over a <i>Triodia epactia</i> hummock grassland.	Excellent
Sandplain Q	Scattered low <i>Corymbia flavescens</i> trees over an open <i>Acacia ancistrocarpa</i> and <i>Acacia bivenosa</i> shrubland over scattered low <i>Acacia stellaticeps</i> shrubs over a <i>Triodia epactia</i> and <i>Triodia lanigera</i> hummock grassland.	Excellent

Source: ENV (2009a, 2009b)

## SIGNIFICANT TERRESTRIAL SPECIES MANAGEMENT PLAN

### 1.8 FAUNA

The Interim Biogeographic Regionalisation of Australia (IBRA) divides the Australian continent into 85 biogeographic regions based on their climatic, faunal, vegetation, landform and geological features (Environment Australia 2004). The Outer Harbour Development is located within the Pilbara region, which is further subdivided into the Hamersley, Fortescue Plains, Chichester and Roebourne sub-regions. The Outer Harbour Development is located within the Roebourne sub-region which typically contains alluvial and colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *Acacia pyrifolia* and *Acacia inaequilatera*. The subregion also contains areas of Samphire, *Sporobolus* and mangal on marine alluvial flats and river deltas.

The field surveys completed by ENV (2009c, 2009d) identified the following habitat types for the Outer Harbour Development:

- Dunal areas - Low *Acacia stellaticeps* shrublands over \**Cenchrus ciliaris* grasslands (north-facing dunes), or open *Crotalaria cunninghamii* shrublands over \**Cenchrus ciliaris* grasslands (south-facing dunes);
- Riverine – Thick vegetation dominated by *Eucalyptus* species;
- Mangroves – Stands of *Avicennia marina*;
- Tidal flats – Large open bare areas, scattered *Avicennia marina* shrubs and scattered low samphire species;
- Samphire areas – Large open muddy areas with scattered *Avicennia marina* shrubs over a low open *Tecticornia halocnemoides* subsp. *tenuis*, *Tecticornia halocnemoides* and *Trianthema turgidifolia* shrubland; and
- Sandplains – Thick vegetation dominated by *Acacia* species.

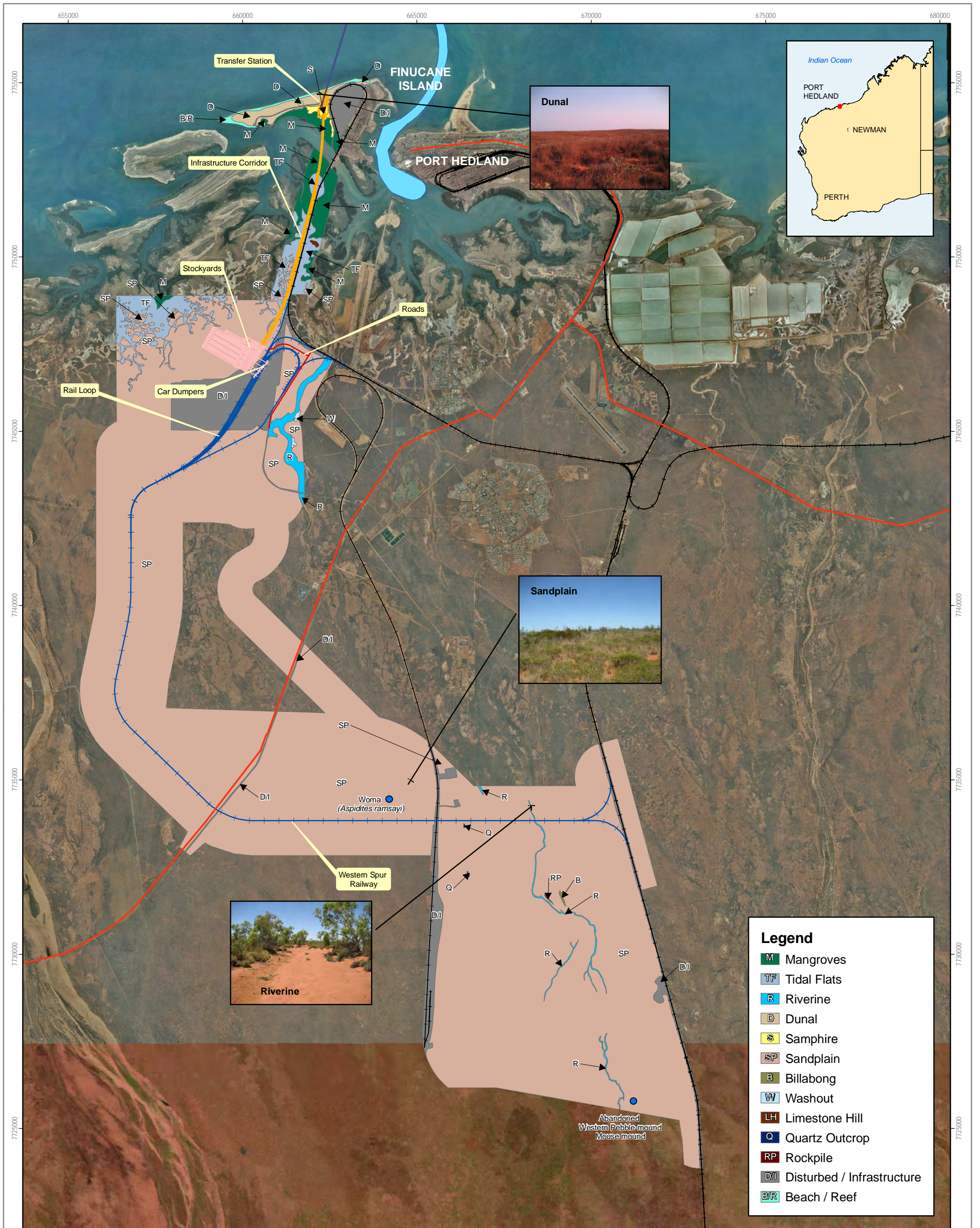
Terrestrial habitats that are relevant to this STSMP include dunal areas, riverine and sandplain habitats as they occur above the high-tide water mark. Fauna habitats recorded within the Outer Harbour Development are shown in **Figure 2.2**.

No threatened ecological communities or PECs are known to occur within the Outer Harbour Development.

Fauna surveys conducted in the project area recorded 151 species of the 366 species of terrestrial vertebrate fauna which may potentially occur in the Project area (ENV 2009c, 2009d). Of these 151 species recorded, terrestrial fauna included 26 mammal species, 53 reptile species, 7 amphibian species and 65 terrestrial avifauna species (ENV 2009c, 2009d). Ten introduced species of fauna were recorded.

Of the 151 recorded terrestrial fauna, three are fauna of conservation significance (ENV 2009c, 2009d). Fauna species of conservation significance that have been recorded at the Outer Harbour Development during baseline fauna surveys are shown in **Figure 2.2**.





**Legend**









- |  |   |
|--|---|
|  Existing Shipping Channel        |  Principal Road                |
|  Proposed Jetty                   |  Existing Railways             |
|  Proposed Infrastructure Corridor |  Proposed Roads                |
|  Proposed Stockyards              |  Proposed Western Spur Railway |

Figure 2.2 Fauna Habitats Recorded in the Survey Area



Scale = 1:100,000 at A3

Datum: GDA94  
Projection: MGA94 Zone 50



Source:  
Fauna Habitats and Fauna Sites (ENV 2008a)  
Orthorectified Aerial Photograph: 08/06/2008 (BHPBIO)  
Topography: Geoscience Australia, GEODATA Topo  
250K V3.  
Habitat Photos: SKM 2009



## SIGNIFICANT TERRESTRIAL SPECIES MANAGEMENT PLAN

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### 1.9 SHORT-RANGE ENDEMIC FAUNA

A short-range endemic fauna survey of the Outer Harbour Development, inclusive of a SRE habitat assessment and targeted searches for SRE, was undertaken by ENV (2009e).

Potential SRE habitat identified within the Outer Harbour Development included limestone rocky outcrops, which were located on the northern side of Finucane Island (ENV 2009e). This habitat is known to be common along the Pilbara coastline.

Targeted searches within potential SRE habitat within the Outer Harbour Development recorded invertebrates from taxonomic orders known to contain SRE taxa. These orders included:

- Gastropods (snails): *Pupoides contrarius*, *Purpoides lepidulus*. These species are considered to have a widespread coastal distribution between Shark Bay and Port Hedland.
- Araneae (spiders): *Aname mainae* (Family Nemesiidae: Trapdoor spiders). This species is considered to have a widespread distribution along the coast of southern WA and the coast of the Midwest. The record at Finucane Island represents a considerable range extension for this species.

The invertebrate species recorded are all considered to be geographically widespread and therefore, at the species level are not considered to constitute SRE taxa (ENV 2009e).

## 2 RECORDED AND POTENTIAL SIGNIFICANT SPECIES

### 2.1 RECORDED SIGNIFICANT SPECIES

Recorded significant species within the Outer Harbour Development are classed as either requiring Level 1 or Level 2 management following BHP Billiton Iron Ore's management hierarchy for significant species (**Table 1.1**).

Four flora species, *Goodenia nuda*, *Heilotropium muticum*, *Tephrosia rosea* var. *venulosa* and *Pterocaulon* sp. A Kimberley Flora, and one fauna species of conservation significance, *Aspidites ramsayi* (Woma Python) have been identified within the Outer Harbour Development disturbance envelope during baseline fauna surveys (ENV 2009a, 2009b, 2009c and 2009f) and are classed as Level 1 (**Table 1.1**). As a recent record exists on the DEC's Threatened Fauna Database for *Dasyercus blythi* (Brush-tailed Mulgara) in the Boodarie area within the Outer Harbour Development, this species has been classed as Level 1. Two bird species have been identified within the Outer Harbour Development but are unlikely to be impacted by the proposed development owing to their mobile nature and as a result, are classed as Level 2 (**Table 1.1**). One Priority Flora species, *Gymnanthera cunninghamii*, was recorded outside of the proposed disturbance envelope and is therefore classed as Level 2 as it is unlikely to be impacted by the project in the next five years.

The locations of significant species identified at the Outer Harbour Development are listed in **Table 2.1** and shown on **Figure 1.2**.

### 2.2 POTENTIAL SIGNIFICANT SPECIES

Significant species with the potential to occur within the Outer Harbour Development are all categorised as requiring a Level 3 management response as defined in **Section 1.5**. These species are:

- *Acacia glaucocaesia* (DEC – Priority 3);
- *Bulbostylis burbidgeae* (DEC – Priority 3);
- *Crotalaria spectabilis* subsp. *spectabilis* (DEC – Priority 1);
- *Euphorbia clementii* (DEC – Priority 2);
- *Gomphrena pusilla* (DEC – Priority 2);
- *Ptilotus appendiculatus* var. *minor* (DEC – Priority 1);
- Blind Snake (*Ramphotyphlops ganei*) (DEC – Priority 1);
- Brush-tailed Mulgara (*Dasyercus blythi*) (EPBC Act– Vulnerable, WC Act – Schedule 1, DEC – Priority 4);
- Bush Stone-curlew (*Burhinus grallarius*) (DEC – Priority 4);
- Ghost Bat (*Macroderma gigas*) (DEC – Priority 4);
- Grey Falcon (*Falco hypoleucos*) (DEC – Priority 4);
- Lakeland Downs Mouse (*Leggadina lakedownsensis*) (DEC – Priority 4);
- Peregrine Falcon (*Falco peregrinus*) (DEC - Priority 4);
- Pilbara Leaf-nosed Bat (*Rhinioncteris aurantia*) (EPBC Act– Vulnerable, WC Act – Schedule 1); and
- Star Finch (*Neochima ruficauda clarescens*) (DEC – Priority 4).

None of these significant species have been recorded within the Outer Harbour Development, however they all have the potential to occur as they are known to occur in the wider area and/or suitable habitat exists at the Outer Harbour Development (ENV 2009a, 2009b, 2009c, 2009d and 2009f).



**SIGNIFICANT TERRESTRIAL SPECIES MANAGEMENT PLAN**

**Table 2.1 – Locations of Species of Conservation Significance**

Species	Conservation Classification (see Appendix A)	BHP Billiton Iron Ore Management Hierarchy <sup>4</sup>	Reference	Easting (mE)	Northing (mN)
<b>Flora</b>					
<i>Tephrosia rosea</i> var. <i>venulosa</i>	Priority 1 <sup>1</sup>	Level 1	ENV 2009a ENV 2009f	661754 654479 654694 659457 661342 662153 663542 662913 662417 670455	7754432 7746746 7745572 7744960 7748350 7747358 7746564 7740130 7738890 7735383
<i>Pterocaulon</i> sp. A <i>Kimberley Flora</i>	Priority 2 <sup>1</sup>	Level 1	ENV 2009a	658157 661375	7747023 7747358
<i>Gymnanthera cunninghamii</i>	Priority 3 <sup>1</sup>	Level 2	ENV 2009a	661706 662037	7744100 7741007
<i>Goodenia nuda</i>	Priority 3 <sup>1</sup>	Level 1	ENV 2009a ENV 2009f	659162 659837 656265 668537	7749449 7746994 7744976 7733845
<i>Heliotropium muticum</i>	Priority 1 <sup>1</sup>	Level 1	ENV 2009a ENV 2009f	665990 670521 670554 666238 670753	7734226 7734705 7733763 7731943 7726105
<b>Fauna</b>					
Australian Bustard ( <i>Ardeotis australis</i> )	Priority 4 <sup>2</sup>	Level 2	ENV 2009c	662919 660249 661247 662405	7740138 7739212 7733861 7734613
Brush-tailed Mulgara ( <i>Dasyercus blythi</i> )	Vulnerable <sup>4</sup> Schedule 1 <sup>3</sup> Priority 4 <sup>2</sup>	Level 1	DEC 2009	Not known	Not known
Rainbow Bee-eater ( <i>Merops ornatus</i> )	Migratory <sup>4</sup>	Level 2	ENV 2009c	662788 661418	7739999 7745816
Woma ( <i>Aspidites ramsayi</i> )	Schedule 5 <sup>3</sup> Priority 1 <sup>2</sup>	Level 1	ENV 2009c	664207	7734443

<sup>1</sup> Listed in DEC *Priority Flora List*.

<sup>2</sup> Listed in DEC *Priority Fauna List*.

<sup>3</sup> Listed in Wildlife Conservation (Specially Protected Fauna) Notice 2005.

<sup>4</sup> Listed in EPBC Act.

## SIGNIFICANT TERRESTRIAL SPECIES MANAGEMENT PLAN

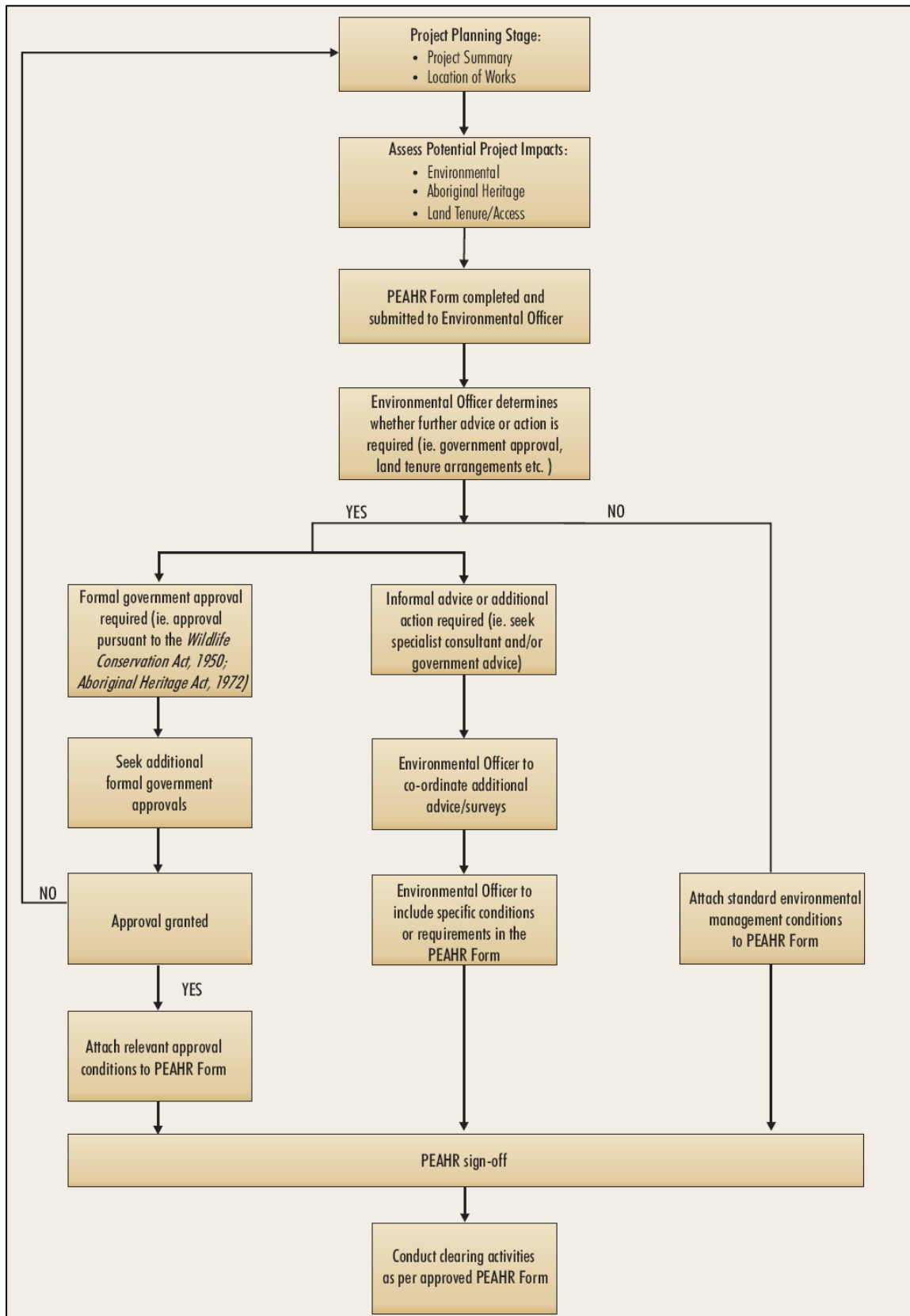
### 3 GENERAL MANAGEMENT MEASURES FOR FLORA AND FAUNA

The following general control measures will be used to minimise the potential impacts of the Outer Harbour Development on flora and fauna:

- The area of land disturbance at the Outer Harbour Development will be kept to the practicable minimum. Cleared areas no longer required for construction purposes will be progressively rehabilitated.
- The location of significant flora and fauna species, their habitat and significant vegetation types will be recorded on the relevant environmental management databases. These records will be updated as necessary and will be used at planning and operational levels.
- BHP Billiton Iron Ore's Environmental Officer for the Outer Harbour Development (or nominated delegate) will retain all records of areas that have been disturbed in the vicinity of the Project and record all significant flora populations that have been impacted within these disturbed areas.
- Where clearing of new areas is necessary, prior approval from BHP Billiton Iron Ore via the Project Environment and Aboriginal Heritage Review (PEAHR) land clearing procedure is required before works commence. The PEAHR procedure includes an assessment of the presence or absence of significant species in the area to be cleared based on the baseline survey results of the Outer Harbour Development. The PEAHR procedure is summarised in **Figure 4.1**.
- BHP Billiton Iron Ore's Environmental Officer for the Outer Harbour Development (or nominated delegate) will include any operational flora and fauna management requirements in the PEAHR authorisation form for the relevant planned clearing area. These management requirements will be determined on a case by case basis and may include, but are not necessarily restricted to, the following:
  - requirements to salvage and temporarily stockpile particular vegetation types or habitat features (i.e. vegetation, stumps, logs, boulders) for use in rehabilitation programmes; and
  - specific management measures to minimise impacts of species of conservation significance that may occur within or near the planned clearing area (i.e. identification of a particular species, protocol for reporting, requirements to avoid/collect/record).
- Disturbance permits will be prepared prior to clearing taking place to identify the extent of the area authorised to be cleared. The area to be cleared will be identified on the ground (with pegs and/or flagging tape). The BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development (or nominated delegate) will check the ground markings and regularly monitor clearing operations to assess whether the plans are being adhered to.
- All relevant contractors will adhere to the conditions of the disturbance permits.
- Vehicle and equipment access will be restricted to designated access roads where possible.
- Vehicles and machinery will remain within the disturbance envelope and all activities will be managed in accordance with the Construction Environmental Management Plan.
- Dust control measures such as road watering, and progressive rehabilitation of disturbed areas will be used to minimise dust from the site adversely affecting flora and fauna.
- BHP Billiton will develop and implement a Weed Management Program in consultation with DEC. Fill will be acquired from weed-free sources.



Figure 3.1 PEHR Procedure



## SIGNIFICANT TERRESTRIAL SPECIES MANAGEMENT PLAN

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- Weed management measures will be implemented in accordance with the BHP Billiton Iron Ore's Construction Environmental Management Plan.
- Pest control measures will be implemented in accordance with BHP Billiton Iron Ore's Construction Environmental Management Plan. These control measures may include, but are not necessarily limited to, the prohibition of domestic animals on site, and maintaining a rubbish-free environment.
- BHP Billiton Iron Ore's Environmental Officer for the Outer Harbour Development (or nominated delegate) will regularly review the conservation status of flora and fauna species (DRF, Scheduled, Priority or other), development of State and Commonwealth flora and fauna management strategies and action plans, and developments in flora and fauna management methods in the Minerals Industry, by keeping abreast of relevant literature (refer to **Section 7**) and consultation with DEC.
- The Outer Harbour Development induction programme will be used to promote awareness of flora and fauna management measures (including significant species) that are to be used.
- Specific training in flora and fauna management measures (including significant species) will be provided to relevant BHP Billiton Iron Ore personnel and contractors.
- BHP Billiton Iron Ore's information sheets for flora and fauna aspects of particular relevance to the Outer Harbour Development site (e.g. management of particular significant species, weeds, or pests) will be developed and distributed amongst relevant employees and contractors to increase awareness.
- Injured fauna found within the Outer Harbour Development will be reported to BHP Billiton Iron Ore.

## SIGNIFICANT TERRESTRIAL SPECIES MANAGEMENT PLAN

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### 4 SPECIFIC MANAGEMENT MEASURES FOR SPECIES OF CONSERVATION SIGNIFICANCE

The level of management response for significant species will vary depending on their ranking in the impact hierarchy as defined in **Section 1.5**.

#### 'Level 1' Significant Species

Species classified as 'Level 1' require the highest degree of management, as they are known to occur in or near to planned disturbance areas. In order to minimise potential impacts on Level 1 significant species the following will occur:

- the planning process outlined in **Section 4.1** will be implemented;
- the general flora and fauna management measures outlined in **Section 4.2** will be implemented; and
- the species-specific management measures contained in each of the significant species management plans in **Section 5.1** will be implemented.

#### 'Level 2' Significant Species

Species classified as 'Level 2' require specific monitoring, but fewer management measures, as they are considered unlikely to be directly impacted over the next five years. In order to minimise potential impacts on Level 2 significant species the following will occur:

- the general flora and fauna management measures outlined in **Section 4.2** will be implemented;
- BHP Billiton Iron Ore's Environmental Officer for the Outer Harbour Development (or nominated delegate) will monitor for the presence of these species in existing and proposed disturbance areas as described in each of the significant species management plans in **Section 5.2**; and
- in the event that a new record of a Level 2 species is made in an existing or proposed disturbance area, species-specific management measures will be developed, included in the relevant significant species management plan (**Section 5.2**) and implemented.

#### 'Level 3' Significant Species

Level 3 significant species will be managed by implementing the general flora and fauna management measures outlined in **Section 4.2**. In the event that a record of a Level 3 species is made at the Outer Harbour Development, BHP Billiton Iron Ore's Environmental Officer for the Outer Harbour Development (or nominated delegate) will determine whether the species category should be changed to Level 1 or Level 2. If necessary, additional species-specific management measures will be developed, included in the relevant significant species management plan (**Section 5.3**) and implemented.

## 4.1 LEVEL 1 SIGNIFICANT SPECIES MANAGEMENT PLANS

*Goodenia nuda****Goodenia nuda***

**BHP Billiton Iron Ore Management Hierarchy:** LEVEL 1

**Description:** Erect to ascending herb growing to 0.5 m high.

**Flowers:** Yellow flowers from April to August.

**Fruit:** Nil.

**Habitat:** Mulga scrub or woodland, sparse scrubland and grassland.

**Status:** Priority 3 – Poorly Known Taxa. Taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.

***Known Locations at the Outer Harbour Development:***

- *Goodenia nuda* has been recorded within the disturbance envelope of the Outer Harbour Development (see **Figure 1.3**).

***General Management Measures:***

- Implement the management measures described in **Section 4**.

***Specific Management Measures:***

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) is responsible for incorporating the following actions/restrictions into the PEHR process for the areas surrounding the known locations of *Goodenia nuda*:
  - Prior to any clearance in an area where *Goodenia nuda* has been identified, a targeted survey, for *Goodenia nuda* should be conducted to identify any populations and determine the level of impact on *Goodenia nuda*.
  - Provide information regarding the significance of *Goodenia nuda* to managers responsible for any clearing or construction activities prior to the commencement of clearing/construction.
  - Clearance plans will be modified, where practicable to minimise or avoid impacts on *Goodenia nuda*.
- During clearing/construction in the areas surrounding the known locations of *Goodenia nuda*, the BHP Billiton Iron Ore Environmental Officer (or nominated delegate) will:
  - Work alongside construction personnel to assist in minimising impact on *Goodenia nuda* Flora during clearing/construction operations.
  - Clearly demarcate identified populations of *Goodenia nuda* located in the vicinity of disturbance areas.
  - Maintain appropriate records of impacted populations.
- In areas known to contain *Goodenia nuda*, topsoil should be stockpiled during clearing activities.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** DEC (2009) Florabase – The Western Australian Flora.  
 ENV (2009a) Outer Harbour Development Flora and Vegetation Assessment  
 ENV (2009f) Port Hedland Area Targeted Priority Flora Survey



*Heliotropium muticum****Heliotropium muticum*****BHP Billiton Iron Ore Management Hierarchy: LEVEL 1**

**Description:** Ascending to spreading perennial, herb growing to heights of 0.3 m.

**Flowers:** White.

**Fruit:** Unknown.

**Habitat:** Unknown.

**Fruit:** Unknown.

**Status:** Priority 1 – Poorly Known Taxa. Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

**Known Locations at the Outer Harbour Development:**

- *Heliotropium muticum* has been recorded within the disturbance envelope of the proposed Western Spur Railway (refer to **Section 3** and **Figure 1.3**).

**General Management Measures:**

- Implement the management measures described in **Section 4**.

**Specific Management Measures:**

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) is responsible for incorporating the following actions/restrictions into the PEHR process for the areas surrounding the known locations of *Heliotropium muticum*:
  - Prior to any clearance in an area where *Heliotropium muticum* has been identified a targeted survey for *Heliotropium muticum* should be conducted to identify any populations and determine the level of impact on *Heliotropium muticum*.
  - Provide information regarding the significance of *Heliotropium muticum* to managers responsible for any clearing or construction activities prior to the commencement of clearing/construction.
  - Clearance plans will be modified, where practicable to minimise or avoid impacts on *Heliotropium muticum*.
- During clearing/construction in the areas surrounding the known locations of *Heliotropium muticum*, the BHP Billiton Iron Ore Environmental Officer (or nominated delegate) will:
  - Work alongside construction personnel to assist in minimising impact on *Heliotropium muticum* during clearing/construction operations.
  - Clearly demarcate identified populations of *Heliotropium muticum* located in the vicinity of disturbance areas.
  - Maintain appropriate records of impacted populations.
- In areas known to contain *Heliotropium muticum*, topsoil should be stockpiled during clearing activities.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** DEC (2009) Florabase – The Western Australian Flora.  
 ENV (2009a) Outer Harbour Development Flora and Vegetation Assessment  
 ENV (2009f) Port Hedland Area Targeted Priority Flora Survey

*Pterocaulon sp. A Kimberley Flora****Pterocaulon sp. A Kimberley Flora*****BHP Billiton Iron Ore Management Hierarchy: LEVEL 1**

**Description:** Compact shrub growing to 0.5 m high. Fl. blue, purple, Apr-Aug

**Flowers:** Blue and purple flowers from April through to August.

**Fruit:** Nil.

**Habitat:** Sand. Coastal areas, saline sandy flats, pindan sandplain.

**Status:** Priority 2 – Poorly Known Taxa. Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

***Known Locations at the Outer Harbour Development:***

- *Pterocaulon sp. A Kimberley Flora* has been recorded within the disturbance envelope of the Outer Harbour Development (see **Figure 1.3**).

***General Management Measures:***

- Implement the management measures described in **Section 4**.

***Specific Management Measures:***

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) is responsible for incorporating the following actions/restrictions into the PEHR process for the areas surrounding the known locations of *Pterocaulon sp. A Kimberley Flora*:
  - Prior to any clearance in an area where *Pterocaulon sp. A Kimberley Flora* has been identified a targeted survey for *Pterocaulon sp. A Kimberley Flora* should be conducted to identify any populations and determine the level of impact on *Pterocaulon sp. A Kimberley Flora*.
  - Provide information regarding the significance of *Pterocaulon sp. A Kimberley Flora* to managers responsible for any clearing or construction activities prior to the commencement of clearing/construction.
  - Clearance plans will be modified, where practicable to minimise or avoid impacts on *Pterocaulon sp. A Kimberley Flora*.
- During clearing/construction in the areas surrounding the known locations of *Pterocaulon sp. A Kimberley Flora*, the BHP Billiton Iron Ore Environmental Officer (or nominated delegate) will:
  - Work alongside construction personnel to assist in minimising impact on *Pterocaulon sp. A Kimberley Flora* during clearing/construction operations.
  - Clearly demarcate identified populations of *Pterocaulon sp. A Kimberley Flora* located in the vicinity of disturbance areas.
  - Maintain appropriate records of impacted populations.
- In areas known to contain *Pterocaulon sp. A Kimberley Flora*, topsoil should be stockpiled during clearing activities.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** DEC (2009) Florabase – The Western Australian Flora.  
 ENV (2009a) Outer Harbour Development Flora and Vegetation Assessment  
 ENV (2009f) Port Hedland Area Targeted Priority Flora Survey

*Tephrosia rosea var. venulosa****Tephrosia rosea var. venulosa*****BHP Billiton Iron Ore Management Hierarchy:****LEVEL 1**

**Description:** Erect shrub growing to 1.7 m high. Fl. red, purple, Aug–Sep.

**Flowers:** Red and purple flowers from August to September.

**Habitat:** Red sand and near creeks.

**Status:** Priority 1 – Poorly Known Taxa. Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

**Known Locations at the Outer Harbour Development:**

- *Tephrosia rosea var. venulosa* has been recorded at numerous locations within the disturbance envelope of the Outer Harbour Development (refer to **Section 3** and **Figure 1.3**) during a flora and vegetation assessment and Priority Flora search by ENV (ENV 2009a, 2009d).

**General Management Measures:**

- Implement the management measures described in **Section 4**.

**Specific Management Measures:**

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) is responsible for incorporating the following actions/restrictions into the PEHR process for the areas surrounding the known locations of *Tephrosia rosea var. venulosa*:
  - Provide information regarding the significance of *Tephrosia rosea var. venulosa* to managers responsible for any clearing or construction activities prior to the commencement of clearing/construction.
  - Clearance plans will be modified, where practicable to minimise or avoid impacts on *Tephrosia rosea var. venulosa*.
- During clearing/construction in the areas surrounding the known locations of *Tephrosia rosea var. venulosa*, the BHP Billiton Iron Ore Environmental Officer (or nominated delegate) will:
  - Work alongside construction personnel to assist in minimising impact on *Tephrosia rosea var. venulosa* during clearing/construction operations.
  - Clearly demarcate identified populations of *Tephrosia rosea var. venulosa* located in the vicinity of disturbance areas.
  - Maintain appropriate records of impacted populations.
- In areas known to contain *Tephrosia rosea var. venulosa*, topsoil should be stockpiled during clearing activities.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** DEC (2009) Florabase – The Western Australian Flora.  
 ENV (2009a) Outer Harbour Development Flora and Vegetation Assessment  
 ENV (2009b) Goldsworthy Rail Duplication Flora and Vegetation Assessment  
 ENV (2009f) Port Hedland Area Targeted Priority Flora Survey

Brush-tailed Mulgara (*Dasyercus blythi*)

 Brush-tailed Mulgara (*Dasyercus blythi*)

 BHP Billiton Iron Ore Management Hierarchy: **LEVEL 1**

**Description:** The body is a light sandy brown above and greyish-white below. Hairs reddish on base of tail, black on distal two-thirds. Black hairs increase in length towards tip and form a dorsal crest. Ears short and rounded. Five toes on fore and hindfeet. Approximate body size is 125 to 220 mm (males) and 125 to 170 mm (females).

**Habitat:** Arid sandy regions, living in burrows dug between low sand-dunes or slopes of high dunes.

**Feeding:** Insects, other arthropods and small vertebrates.

**Status:** This species was previously known as *Dasyercus cristicauda*.

No Photograph Available

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

Vulnerable (EPBC Act) – Within the next 2 years, the species is likely to become endangered unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate.

Priority 4 (DEC) – Taxa in need of monitoring: not currently threatened or in need of special protection, but could become so. Usually represented on conservation lands.

**Known Locations at the Outer Harbour Development:**

- Not identified at the Outer Harbour Development to date but recent (2008) records exist in the Boodarie area 5 km west of South Hedland.
- The Brush-tailed Mulgara may potentially occur within the sandplain habitat of the proposed Outer Harbour Development.

**General Management Measures:**

- Implement the management measures described in **Section 4**.

**Specific Management Measures:**

- Minimise disturbance in sandplain habitat.
- The BHP Billiton Iron Ore Outer Harbour Development Officer (or nominated delegate) will conduct periodic visual inspections of potential habitat areas for the Mulgara.
- Maintain appropriate records of impacted populations.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** ENV (2009c) Outer Harbour Development Fauna Assessment



**Woma Python (*Aspidites ramsayi*)****Woma Python (*Aspidites ramsayi*)****BHP Billiton Iron Ore Management Hierarchy:** LEVEL 1

**Description:** A python which is grey, olive, golden brown or rich red-brown in colour ringed with darker bands. The belly is cream to yellow. It can grow to 2.7 m in length, although the average length is 1.5 m. The head is narrow and pointed.

No Photograph Available

**Habitat:** Sandy areas covered with Spinifex.

**Feeding:** Small marsupials and rodents

**Status:** Schedule 4 (WC Act) - Other specially protected fauna.  
Priority 1 (DEC) – Taxa with few, poorly known populations on threatened lands.

**Known Locations at the Outer Harbour Development:**

- This species was identified within sandplain habitat in the southern extent of the Outer Harbour Development outside of the proposed disturbance envelope.
- The proposed infrastructure corridor, stockyards and rail will impact on sandplain habitat in which the Woma may potentially occur.

**General Management Measures:**

- Implement the management measures described in **Section 4**.

**Specific Management Measures:**

- Minimise disturbance in sandplain habitat.
- The BHP Billiton Iron Ore Outer Harbour Development Officer (or nominated delegate) will conduct periodic visual inspections of potential habitat areas for the Woma.
- Maintain appropriate records of impacted populations.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** ENV (2009c) Outer Harbour Development Fauna Assessment.  
Wilson, S., Swan G. (2003). A complete Guide to Reptiles of Australia

## 4.2 LEVEL 2 SIGNIFICANT SPECIES MANAGEMENT PLANS

*Gymnanthera cunninghamii****Gymnanthera cunninghamii*****BHP Billiton Iron Ore Management Hierarchy: LEVEL 2**

**Description:** Erect shrub growing 1 to 2 m high.

**Flowers:** Yellow / green flowers from January through to December.

No Photograph Available

**Fruit:** Nil.

**Habitat:** Occurs within sandy soils.

**Status:** Priority 3 – Poorly Known Taxa. Taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.

**Known Locations at the Outer Harbour Development:**

- *Gymnanthera cunninghamii* has been recorded outside of the Outer Harbour Development to the south of the proposed rail loop and to west of the proposed infrastructure corridor (refer to **Section 3** and **Figure 1.3**). Three of the five recorded locations have been located within or near drainage lines or creeks (ENV 2008a).

**General Management Measures:**

- Implement the management measures described in **Section 4**.

**Specific Management Measures:**

- Minimise disturbance to ENV mapped vegetation types 'washout', 'drainage line' and 'minor drainage line' in which this species has been previously recorded.
- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) will conduct periodic visual inspections of potential habitat areas for *Gymnanthera cunninghamii*.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** DEC (2009) Florabase – The Western Australian Flora.  
 ENV (2009a) Outer Harbour Development Flora and Vegetation Assessment  
 ENV (2009f) Port Hedland Area Targeted Priority Flora Survey

#### 4.2.2 Australian Bustard (*Ardeotis australis*)

##### Australian Bustard (*Ardeotis australis*)

##### BHP Billiton Iron Ore Management Hierarchy: LEVEL 2

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

**Habitat:** Tussock grassland, grassy woodland and low woodlands.

**Feeding:** Insects, small vertebrates, seeds and fruit.

**Status:** Priority 4 (DEC) – Taxa in need of monitoring: not currently threatened or in need of special protection, but could become so.



##### **Known Locations at the Outer Harbour Development:**

- The Australian Bustard has been recorded at four locations within sandplain habitat near the Outer Harbour Development (ENV 2009d).

##### **General Management Measures:**

- Implement the management measures described in **Section 4**.

##### **Specific Management Measures:**

- Minimise disturbance to tussock grasslands.
- BHP Billiton Iron Ore's Environmental Officer for the Outer Harbour Development (or nominated delegate) will conduct periodic visual inspections of potential habitat areas for the Australian Bustard

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** Simpson & Day (1999). Field Guide to the Birds of Australia.  
ENV (2009c) Outer Harbour Development Fauna Assessment



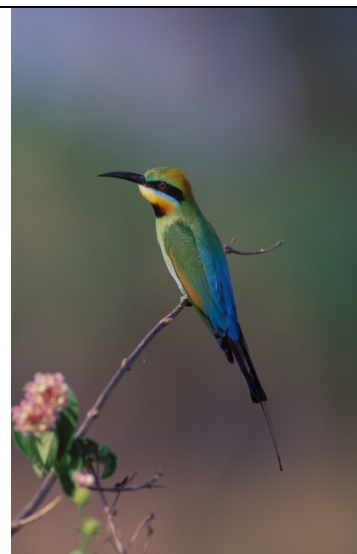
Rainbow Bee-eater (*Merops ornatus*)Rainbow Bee-eater (*Merops ornatus*)BHP Billiton Iron Ore Management Hierarchy: **LEVEL 2**

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

**Habitat:** Open country, including sand dunes and banks.

**Feeding:** The majority of its diet consists of insects.

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

**Known Locations at the Outer Harbour Development:**

- One individual of the Rainbow Bee-eater was recorded within the Outer Harbour Development (ENV 2009d) however no specific locations have been identified.
- The Rainbow Bee-eater prefers open country, including sand dunes and banks and will nest in small holes excavated in sandy banks or flat surfaces.
- The Riverine habitat within the Outer Harbour Development may be suitable for nesting of this species.

**General Management Measures:**

- Implement the management measures described in **Section 4**.

**Specific Management Measures:**

- Minimise disturbance near/within creeks/drainage lines with banks that may provide suitable habitat for the Rainbow Bee-eater.
- During its summer breeding period (October to February) the BHP Billiton Iron Ore Environmental Officer (or nominated delegate) will conduct periodic visual inspections of potential habitat areas for the Rainbow Bee-eater.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** Simpson & Day (1999). Field Guide to the Birds of Australia.  
ENV (2009c) Outer Harbour Development Fauna Assessment

## 4.3 LEVEL 3 SIGNIFICANT SPECIES MANAGEMENT PLANS

*Acacia glaucocaesia****Acacia glaucocaesia*****BHP Billiton Iron Ore Management Hierarchy: LEVEL 3**

**Description:** Dense, glabrous shrub or tree, growing 1.8 to 6 m high. Fl. yellow, Jul–Sep. Red loam, sandy loam, clay. Floodplains.

**Flowers:** Yellow flowers from July to September.

**Fruit:** Nil.

No Photograph Available

**Habitat:** Occurs within red loam, sandy loam and clay associated with floodplains.

**Status:** Priority 3 – Poorly Known Taxa. Taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.

***Known Locations at the Outer Harbour Development:***

- Not identified at or near the Outer Harbour Development to date.

***General Management Measures:***

- Implement the management measures described in **Section 4**.

***Specific Management Measures:***

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) will develop and implement specific management measures for *Acacia glaucocaesia* if required.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** DEC (2009) Florabase – The Western Australian Flora.  
ENV (2009a) Outer Harbour Development Flora and Vegetation Assessment.

**SIGNIFICANT TERRESTRIAL SPECIES MANAGEMENT PLAN****4.3.2 *Bulbostylis burbidgeae******Bulbostylis burbidgeae*****BHP Billiton Iron Ore Management Hierarchy: LEVEL 3**

**Description:** Tufted, erect to spreading annual, grass-like or herb (sedge) growing to 0.03 to 0.25 m high. Spikelets are in a simple umbel or rarely solitary; stamens 3; involucre bracts long.

**Flowers:** Brown flowers from March / June to August.

No Photograph Available

**Habitat:** Found within granitic soils around granite outcrops and cliff bases.

**Fruit:** Unknown.

**Status:** Priority 3 – Poorly Known Taxa. Taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.

***Known Locations at the Outer Harbour Development:***

- Not identified at the Outer Harbour Development to date.

***General Management Measures:***

- Implement the management measures described in **Section 4**.

***Specific Management Measures:***

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) will develop and implement specific management measures for *Bulbostylis burbidgeae* if required.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for Outer Harbour Development.

**Further Reading:** DEC (2009) Florabase – The Western Australian Flora.  
ENV (2009a) Outer Harbour Development Flora and Vegetation Assessment



4.3.3 *Crotalaria spectabilis* subsp. *spectabilis****Crotalaria spectabilis* subsp. *spectabilis*****BHP Billiton Iron Ore Management Hierarchy: LEVEL 3****Description:** Annual herb growing to 2 m high**Flowers:** Yellow flowers.**Fruit:** Nil.**Habitat:** Not known.

No Photograph Available

**Status:** Priority 1 – Poorly Known Taxa. Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

***Known Locations at the Outer Harbour Development:***

- Not identified at or near the Outer Harbour Development to date.

***General Management Measures:***

- Implement the management measures described in **Section 4**.

***Specific Management Measures:***

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) will develop and implement specific management measures for *Crotalaria spectabilis* subsp. *spectabilis* if required.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** DEC (2009) Florabase – The Western Australian Flora.  
 ENV (2009a) Outer Harbour Development Flora and Vegetation Assessment.

4.3.4 *Euphorbia clementii****Euphorbia clementii*****BHP Billiton Iron Ore Management Hierarchy:** LEVEL 3**Description:** Erect shrub growing 0.6 m high.**Flowers:** Not known**Habitat:** Gravelly hillsides, stony grounds.

No Photograph Available

**Status:** Priority 2 – Poorly Known Taxa. Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.***Known Locations at the Outer Harbour Development :***

- Not recorded within the Outer Harbour Development to date.

***General Management Measures:***

- Implement the management measures described in **Section 4**.

***Specific Management Measures:***

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) will develop and implement specific management measures for *Euphorbia clementii* if required.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.**Further Reading:** DEC (2009) Florabase – The Western Australian Flora.  
ENV (2009a) Outer Harbour Development Flora and Vegetation Assessment

4.3.5 *Gomphrena pusilla****Gomphrena pusilla*****BHP Billiton Iron Ore Management Hierarchy: LEVEL 3**

**Description:** Slender branching annual herb growing to 0.2 m high.

**Flowers:** White flowers from March to June.

**Fruit:** Nil.

No Photograph Available

**Habitat:** Occurs within fine beach sand typically behind foredunes and on limestone.

**Status:** Priority 2 – Poorly Known Taxa. Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

***Known Locations at the Outer Harbour Development:***

- DEC records exist for *Gomphrena pusilla* outside of the Outer Harbour Development on the eastern side of Finucane Island and within Port Hedland (refer to **Section 3** and **Figure 1.3**).

***General Management Measures:***

- Implement the management measures described in **Section 4**.

***Specific Management Measures:***

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) will review management hierarchy if impacts may occur.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** DEC (2009) Florabase – The Western Australian Flora.  
ENV (2009a) Outer Harbour Development Flora and Vegetation Assessment



4.3.6 *Ptilotus appendiculatus* var. *minor****Ptilotus appendiculatus* var. *minor***BHP Billiton Iron Ore Management Hierarchy: **LEVEL 3****Description:** Prostrate or ascending perennial, herb or shrub.**Flowers:****Fruit:** Nil.**Habitat:** Unknown

No Photograph Available

**Status:** Priority 1 – Poorly Known Taxa. Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

**Known Locations at the Outer Harbour Development:**

- *Ptilotus appendiculatus* var. *minor* has been recorded outside of the Outer Harbour Development to the west of the proposed Western Spur Railway (refer to **Section 3** and **Figure 1.3**).

**General Management Measures:**

- Implement the management measures described in **Section 4**.

**Specific Management Measures:**

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) will develop and implement specific management measures for *Ptilotus appendiculatus* var. *minor* if required

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.**Further Reading:** DEC (2009) Florabase – The Western Australian Flora.  
ENV (2009a) Outer Harbour Development Flora and Vegetation Assessment

4.3.7 Blind Snake (*Ramphotyphlops ganei*)**Blind Snake (*Ramphotyphlops ganei*)**BHP Billiton Iron Ore Management Hierarchy: **LEVEL 3**

**Description:** Harmless, specialized burrowing snakes. Represented by a dark spot beneath head scales. Usually less than 50 cm in length and have well-developed anal glands. Body snakelike; tail tapering; eyes distinct. Body worm-like and tail without taper.

**Habitat:** Moist gorges and gullies in arid environments

**Feeding:** Feed on invertebrates.

**Status:** Priority 1 (DEC) – Taxa with few, poorly known populations on threatened lands.

**Known Locations at the Outer Harbour Development:**

- Not identified at the Outer Harbour Development to date.
- The Blind Snake prefers moist gorges and gullies and may potentially occur within riverine or drainage line habitats found within the Outer Harbour Development.

**General Management Measures:**

- Implement the management measures described in **Section 4**.

**Specific Management Measures:**

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) will develop and implement specific management measures for the Blind Snake if required.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** ENV (2009c) Outer Harbour Development Fauna Assessment

4.3.8 Bush Stone-curlew (*Burhinus grallarius*)**Bush Stone-curlew (*Burhinus grallarius*)****BHP Billiton Iron Ore Management Hierarchy: LEVEL 3**

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

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

**Feeding:** Small vertebrates and invertebrates, as well as seeds and

**Status:** Priority 4 (DEC) – Taxa in need of monitoring: not currently threatened or in need of special protection, but could become so. Usually represented on conservation lands.

**Known Locations at the Outer Harbour Development:**

- Not identified at the Outer Harbour Development to date.
- The Bush Stone-Curlew prefers sparsely grassed, lightly timbered, open forests or woodland which are found within sandplain and riverine habitat within the Outer Harbour Development (ENV 2009b).

**General Management Measures:**

- Implement the management measures described in **Section 4**.

**Specific Management Measures:**

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) will develop and implement specific management measures for the Bush Stone-curlew if required.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** ENV (2009c) Outer Harbour Development Fauna Assessment  
Simpson & Day (1999). Field Guide to the Birds of Australia.



4.3.9 Ghost Bat (*Macroderma gigas*)**Ghost Bat (*Macroderma gigas*)****BHP Billiton Iron Ore Management Hierarchy: LEVEL 3**

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

No Photograph Available

**Habitat:** Requires caves or mineshafts for roosting.

**Feeding:** Australia's only carnivorous bat. Feeds on insects, geckoes, frogs, small birds and mammals.

**Status:** Priority 4 (DEC) – Taxa in need of monitoring: not currently threatened or in need of special protection, but could become so. Usually represented on conservation lands.

**Known Locations at the Outer Harbour Development:**

- Not identified at the Outer Harbour Development to date.
- The Ghost Bat is unlikely to roost within the Outer Harbour Development but may forage within it.

**General Management Measures:**

- Implement the management measures described in **Section 4**.

**Specific Management Measures:**

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) will develop and implement specific management measures for the Ghost Bat if required.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** ENV (2009c) Outer Harbour Fauna Development Assessment  
Strahan (2004) The Mammals of Australia.

Grey Falcon (*Falco hypoleucos*)

**Grey Falcon (*Falco hypoleucos*)**
**BHP Billiton Iron Ore Management Hierarchy: LEVEL 3**

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

**Habitat:** Woodland and scrub types in arid zone.

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

**Status:** Priority 4 (DEC) – Taxa in need of monitoring: not currently threatened or in need of special protection, but could become so. Usually represented on conservation lands.


**Known Locations at the Outer Harbour Development:**

- Not identified at the Outer Harbour Development to date.
- The Grey Falcon prefers woodland and scrub and may potentially occur within sandplain habitat in the Outer Harbour Development.

**General Management Measures:**

- Implement the management measures described in **Section 4**.

**Specific Management Measures:**

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) will develop and implement specific management measures for the Grey Falcon if required.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** ENV (2009c) Outer Harbour Development Fauna Assessment  
Simpson & Day (1999). Field Guide to the Birds of Australia.

4.3.11 Lakeland Downs Mouse (*Leggadina lakedownensis*)**Lakeland Downs Mouse (*Leggadina lakedownensis*)**BHP Billiton Iron Ore Management Hierarchy: **LEVEL 3****Description:** 60 to 75 mm body and 40 to 45 mm tail. Grey colour.**Habitat:** Open grassland with pockets of savannah woodland and sandplains and clay pans with Spinifex.**Feeding:** Native and introduced grass seeds.**Status:** Priority 4 (DEC) – Taxa in need of monitoring: not currently threatened or in need of special protection, but could become so. Usually represented on conservation lands.**Known Locations at the Outer Harbour Development:**

- Not identified at the Outer Harbour Development to date.
- The Lakeland Downs Mouse may potentially occur within sandplain habitat (with a cover of Spinifex) that is found within the Outer Harbour Development.

**General Management Measures:**

- Implement the management measures described in **Section 4**.

**Specific Management Measures:**

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) will develop and implement specific management measures for the Lakeland Downs Mouse if required.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.**Further Reading:** ENV (2009c) Outer Harbour Fauna Development Assessment  
Strahan (2004) The Mammals of Australia.



4.3.12 Peregrine Falcon (*Falco peregrinus*)**Peregrine Falcon (*Falco peregrinus*)****BHP Billiton Iron Ore Management Hierarchy:****LEVEL 3**

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

**Habitat:** Most land types, particularly rocky outcrops and cliffs.

**Feeding:** Small birds typically taken in the air.

**Status:** Schedule 4 (WC Act) - Other specially protected fauna.

**Known Locations at the Outer Harbour Development:**

- Not identified at the Outer Harbour Development to date.
- The Peregrine Falcon prefers rocky outcrops and cliffs, which are not present within the Outer Harbour Development.

**General Management Measures:**

- Implement the management measures described in **Section 4**.

**Specific Management Measures:**

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) will develop and implement specific management measures for the Peregrine Falcon if required.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** ENV (2009c) Outer Harbour Development Fauna Assessment  
Simpson & Day (1999). Field Guide to the Birds of Australia.

**SIGNIFICANT TERRESTRIAL SPECIES MANAGEMENT PLAN**
**4.3.13 Pilbara Leaf-nosed Bat (*Rhinonictoris aurantia*)**
**Pilbara Leaf-nosed Bat (*Rhinonictoris aurantia*)**
**BHP Billiton Iron Ore Management Hierarchy: LEVEL 3**

**Description:** Orange fur, occasionally darkened by brown-tipped hairs, darker fur around eyes. Nose-leaf complexion, lower part broad with central gap at the front; upper part scalloped. Deep nasal pits. Ears small and acutely pointed. Body length approximately 50 mm.

**Habitat:** Requires caves or mineshafts for roosting.

No Photograph Available

**Feeding:** Hunts food during slow manoeuvrable flight. Feeds on mostly moths but also on beetles, shield-bugs, parasitic wasps, ants, chafers and weevils.

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

Vulnerable (EPBC Act) – Within the next 2 years, the species is likely to become endangered unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate.

**Known Locations at the Outer Harbour Development:**

- Not identified at the Outer Harbour Development to date.
- The Pilbara Leaf-nosed Bat is unlikely to roost within the Outer Harbour Development but may forage within it.

**General Management Measures:**

- Implement the management measures described in **Section 4**.

**Specific Management Measures:**

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) will develop and implement specific management measures for the Pilbara Leaf-nosed Bat if required.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** ENV (2009c) Outer Harbour Fauna Development Assessment  
Strahan (2004) The Mammals of Australia.

Star Finch (*Neochmia ruficauda clarescens*)Star Finch (*Neochmia ruficauda clarescens*)BHP Billiton Iron Ore Management Hierarchy: **LEVEL 3**

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

**Habitat:** Tall grass by swamps or water.

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

**Status:** Priority 4 (DEC) – Taxa in need of monitoring: not currently threatened or in need of special protection, but could become so. Usually represented on conservation lands.

**Known Locations at the Outer Harbour Development:**

- Not identified at the Outer Harbour Development to date.
- The Star Finch may potentially occur within drainage lines (ENV 2009b).

**General Management Measures:**

- Implement the management measures described in **Section 4**.

**Specific Management Measures:**

- BHP Billiton Iron Ore's Environmental Officer (or nominated delegate) will develop and implement specific management measures for the Star Finch if required.

**Further Information:** BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development.

**Further Reading:** ENV (2009c) Outer Harbour Development Fauna Assessment  
Simpson & Day (1999). Field Guide to the Birds of Australia.



**5 REPORTING PROCEDURES AND SCHEDULE**

The Port and Rail Annual Environmental Report (AER) will include a summary of any significant species that are recorded during baseline or targeted surveys. It will also include a summary of how the management measures contained in this STSMP have been implemented.

The STSMP will be updated as required during the life of the development (at least every five years) to include changes to the conservation status of species identified on site, new species populations and changes to management measures. The first revision will be conducted within 12 months of terrestrial construction activities commencing. As stated in **Section 4.2**, the BHP Billiton Iron Ore Environmental Officer for the Outer Harbour Development (or nominated delegate) will regularly review the conservation status of flora and fauna species by reviewing current relevant literature and through consultation with DEC. The management hierarchy level for significant species will be subsequently revised and specific management measures developed if required.

## 6 REFERENCES

- Department of Environment and Conservation (DEC) (2009) *FloraBase – The Western Australian Flora* [online], Western Australian Herbarium, Department of Conservation and Land Management. Available from: <http://florabase.calm.wa.gov.au/>.
- ENV (2009a) *Outer Harbour Development Flora and Vegetation Assessment*. A Unpublished report for BHP Billiton Iron Ore.
- ENV (2009b) *Goldsworthy Rail Duplication Flora and Vegetation Assessment*. A Unpublished report for BHP Billiton Iron Ore.
- ENV (2009c). *Outer Harbour Development Fauna Assessment*. A Unpublished report for BHP Billiton Iron Ore.
- ENV (2009d) *Goldsworthy Rail Duplication Fauna Assessment*. A Unpublished report for BHP Billiton Iron Ore.
- ENV (2009e). *Outer Harbour Development Short-range Endemic Fauna Assessment*. A Unpublished report for BHP Billiton Iron Ore.
- ENV (2009f). *Port Hedland Area Targeted Priority Flora Survey*. A Unpublished report for BHP Billiton Iron Ore.
- Environment Australia (2004) *Interim Biographic Regionalisation of Australia*.
- Garnett, S., Gabriel, C. (2000) *The Action Plan for Australian Birds*. Environment Australia, Australia
- Harvey, M.S. (2002) *Short-range endemism among the Australian fauna: some examples from non-marine environments*. Invertebrate Systematics 16: 555-570.
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- Simpson, K., Day, N. (1999) *Field Guide to the Birds of Australia*, Sixth Edition. Penguin Group, Victoria.
- Strahan, R. (2004) *The Mammals of Australia*. Reed New Holland, NSW.
- Wilson, S., Swan G. (2003). *A complete Guide to Reptiles of Australia*, Reed New Holland, NSW.

## A.1 Explanation of Conservation Codes Used in Western Australia

## FLORA

**Environment Protection and Biodiversity Conservation Act 1999**

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

**Definition of Categories Described under the EPBC Act**

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

**Wildlife Conservation Act 1950**

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

**Definition of Declared Rare and Priority Flora Categories**

Code	Definition
<b>DRF</b>	Declared Rare Flora – Extant Taxa. Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection.
<b>P1: Priority One</b>	Poorly Known Taxa. Taxa which are known from one or a few (generally <5) populations which are under threat.
<b>P2: Priority Two</b>	Poorly Known Taxa. Taxa which are known from one or a few (generally <5) population, at least some of which are not believed to be under immediate threat.
<b>P3: Priority Three</b>	Poorly Known Taxa. Taxa which are known from several populations, at least some of which are not believed to be under immediate threat.
<b>P4: Priority Four</b>	Rare Taxa. Taxa which are considered to have been adequately surveyed and which whilst being rare, are not currently threatened by any identifiable factors.

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

## FAUNA

*Commonwealth EPBC Act*

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

**Explanation of Codes for Fauna under the Commonwealth EPBC Act**

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

*WA Wildlife Conservation Act 1950 (Specially Protected Fauna) Notice*

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

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

Code	Definition
<b>Schedule 1</b>	Fauna which are Rare or likely to become extinct, are declared to be fauna that is in need of special protection.
<b>Schedule 2</b>	Fauna which are presumed to be extinct, are declared to be fauna that is in need of special protection.
<b>Schedule 3</b>	Birds which are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is in need of special protection.
<b>Schedule 4</b>	Declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in paragraphs (a), (b) and (c).



## DEC Priority Fauna

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

## Explanation of DEC Priority Fauna Categories

Priority Category	Definition
<b>Priority One</b> <b>Taxa with few, poorly known populations on threatened lands.</b>	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.
<b>Priority Two</b> <b>Taxa with few, poorly known populations on conservation lands.</b>	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.
<b>Priority Three</b> <b>Taxa with several, poorly known populations, some on conservation lands.</b>	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.
<b>Priority Four</b> <b>Taxa in need of monitoring</b>	Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could if present circumstances change. These taxa are usually represented on conservation lands.
<b>Priority Five</b> <b>Taxa in need of monitoring</b>	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.