



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 2836/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: BHP Billiton Iron Ore Pty Ltd

### 1.3. Property details

Property: Iron Ore (Mount Newman) Agreement Act 1964, Special Lease for Mining Operations 3116/3687, Document I 154279 L, Lot 19 on Deposited Plan 48921, Lot 65 on Deposited Plan 48920; Special Lease for Mining Operations 3116/4028, Lots 24, 25, 26 92, 94, 95, 96 on Deposited Plans 241430

Local Government Area: Shire of East Pilbara & Town of Port Hedland  
Colloquial name: Turner Camp to Spring Siding Rail Duplication Project

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
358		Mechanical Removal	Railway construction and maintenance

## 2. Site Information

### 2.1. Existing environment and information

#### 2.1.1. Description of the native vegetation under application

##### Vegetation Description

Beard vegetation associations have been mapped at a 1:250,000 scale for the whole of Western Australia, and are a useful tool to examine the vegetation extent in a regional context. Two Beard vegetation associations are located within the application area (GIS Database):

**93:** Hummock grasslands, shrub steppe; kanji over soft Spinifex; and

**619:** Medium woodland, River Gum (*Eucalyptus camaldulensis*).

Ecologia Environment (Ecologia) conducted a Level 1 flora and vegetation survey of the Mainline Rail Lease (80 metres wide, 60 kilometres long) between Turner Camp and Spring Siding (the application area) between 30 March and 4 April 2008. Further to this, Ecologia conducted flora and vegetation survey over two sites where the proposed Rail Repeater Stations will be built totalling 2.25 hectares each. Repeater Stations Three and Four were surveyed on 3 April 2008 and 28 March 2008, respectively.

The field surveys involved systematic flora sampling in quadrats approximately 50 metres x 50 metres or of an equivalent area within the narrow corridor of the existing rail lease. In total 31 quadrats were sampled from Turner Camp to Spring Siding. Quadrat sites were selected on the basis of topography, and interpretation and ground truthing of aerial photographs. From these surveys the following vegetation associations were identified:

##### Mainline Rail Lease

###### Sandy/Rocky Undulating Plain

1. Scattered *Corymbia hamersleyana* low trees, over sparse *Acacia trudgeana*, *A. inaequilatera*, *A. orthocarpa* high shrubs, over mixed open *A. bivenosa*, *A. orthocarpa*, *A. ancistrocarpa* and *A. eriopoda*, sometimes with *A. coleii* var. *coleii* and *A. tumida* var. *tumida* medium shrubs, over sparse mixed low shrubs of *Indigofera monophylla*, *Bonamia rosea*, *Corchorus parviflorus* and *Aerva javanica* (weed), over moderately dense varying *Triodia lanigera*, *T. epactia*, *T. wiseana* and *T. secunda* hummock grass, sometimes with patches of mixed *Cenchrus ciliaris* (weed), *Aristida contorta* and *Paraneurachne muelleri* tussock grasses.

2. Scattered *Corymbia hamersleyana* low trees, over scattered *Acacia trudgeana* and *A. inaequilatera* high shrubs, over scattered medium to low shrubs of *A. bivenosa*, *A. orthocarpa* and *A. stellaticeps*, over moderately dense varying *Triodia longiceps*, *T. lanigera*, *T. angusta* and *T. epactia* hummock grasses, with sparse patches of *Aristida contorta*, *Cenchrus ciliaris* (weed) and *Eriachne lanata* tussock grass.

###### River Bed/Bank

3. Open to moderately dense *Eucalyptus camaldulensis* var. *obtusa*, *E. victrix* and *Melaleuca argentea* medium trees, over moderately dense mixed *Acacia ampliceps* and *Erythrina vespertilio* low trees, over open mixed *Acacia ampliceps*, *A. trachycarpa*, *A. coleii* var. *coleii*, *Melaleuca glomerata* and *M. linophylla* high to medium shrubs, over moderately dense *Cenchrus ciliaris* (weed) and open *Triodia angusta* hummock grasses, with open *Cyperus blakeanus* or *Cyperus ixiocarpus* sedges.

###### Minor Channel/Creepline

4. Scattered *Eucalyptus camaldulensis* var. *obtusa*, *Acacia coriacea* subsp. *pendens* and *Corymbia hamersleyana* low trees, over mixed open to moderately dense *A. trachycarpa*, sometimes with *A. ampliceps*, *A. acradenia* and *A. pyrifolia* high shrubs, over open *Triodia lanigera*, *T. angusta*, *T. basedowii* and *T. epactia* hummock grasses, with scattered patches of *Cenchrus ciliaris* (weed).

5. Scattered *Corymbia hamersleyana* low trees, over moderately dense *Petalostylis labicheoides* and *Acacia acradenia* high to medium

shrubs, over open mixed *Cenchrus ciliaris* (weed) and *Triodia epactia* and *T. angusta* hummock grasses.

6. Scattered *Corymbia hamersleyana* low trees, over sparse *Acacia bivenosa* high shrubs, over moderately dense mixed *Adriana urticoides* var. *urticoides* and *Pluchea ferdinandi-muelleri* medium to low shrubs, over moderately dense *Cenchrus ciliaris* (weed), with sparse *Triodia secunda* hummock grass.

7. Moderately dense *Acacia tumida* var. *tumida* and *Grevillea wickhamii* high shrubs, over open *Cajanus cinereus* medium shrubs, over sparse mixed *Aerva javanica* (weed) and *Indigofera monophylla* low shrubs, over open *Triodia epactia* hummock and open mixed tussock grasses, dominated by *Perotis rara*.

Granite Outcrop

8. Moderately dense *Acacia acradenia*, *Cajanus cinereus* and *A. pyrifolia* medium shrubs, over open *A. acradenia* low shrubs, over moderately dense *Triodia pungens* hummock grass, with open *Cenchrus ciliaris* (weed) and sparse *Cyperus cunninghamii* subsp. *cunninghamii* sedges.

### Repeater Station Three

Granite Outcrop

1. Scattered *Gossypium australe* medium shrubs, over sparse *Gossypium australe* and *Cajanus cinereus* low shrubs, over open *Ptilotus incanus* var. *incanus* very low shrubs, over isolated clumps of *Cymbopogon ambiguus* tussock and sparse *Triodia pungens* hummock grasses.

Rocky Hill Slope

2. Scattered *Corymbia hamersleyana* low trees, over sparse *Grevillea wickhamii* subsp. *aprica* high, medium and low shrubs, over moderately dense *Triodia pungens* hummock grass.

3. Recently Burnt: Open *Acacia inaequilatera* high shrubs, over open to moderately dense mixed low shrubs of *Corchorus laniflorus* and *Tribulus macrocarpus*, over open to moderately dense mixed *Triodia pungens* and *Triodia lanigera* hummock, with open *Aristida contorta* tussock grasses.

Rocky Plain

4. Open *Corymbia hamersleyana* low trees, over sparse *Acacia eriopoda* and *A. inaequilatera* medium shrubs, over open *Senna notabilis* and *Corchorus laniflorus* low shrubs, over moderately dense *Triodia lanigera* and *Triodia pungens* hummock and sparse *Aristida contorta* tussock grasses.

### Repeater Station Four

Rocky Hill Slope/Ridgetop

1. Open *Acacia maitlandii* and *A. orthocarpa* high shrubs, over scattered *Grevillea wickhamii* medium shrubs, over dense *Triodia pungens* hummock, with sparse *Cymbopogon ambiguus* tussock grasses.

2. Open *Eucalyptus victrix* and *Acacia coriacea* subsp. *pendens* medium trees, over open *A. trachycarpa* and *A. ancistrocarpa* high to medium shrubs, over open *Stemodia grossa* low shrubs, over open *Cyperus squarrosus* sedges, with sparse mixed *Cenchrus ciliaris* tussock and *Triodia pungens* hummock grasses.

### Clearing Description

BHP Billiton Iron Ore Pty Ltd (BHP Billiton) have applied to clear up to 358 hectares of native vegetation within a purpose permit boundary of approximately 478 hectares. The proposed clearing involves duplicating a 60 kilometre section of the Newman to Port Hedland rail line between Turner Camp and Spring Siding south, located approximately 128 - 188 kilometres south of Port Hedland (BHP Billiton, 2008). Associated works will include replacement of an existing bridge at Coonarrie Creek, installation of communications cabling, upgrade of Rail Repeater Stations and signalling infrastructure, improvement of access roads and the establishment of borrow pits and laydown areas (BHP Billiton, 2008).

The Mainline Lease (Special Lease 3116/3687) is generally 80 metres in width, with approximately 40 metres either side of the mainline centreline. The radio communication stations known as Rail Repeater Station Three and Four total 2.25 hectares each and occur separately to the Mainline Lease on Special Lease 3116/4028.

### Vegetation Condition

Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).

to

Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).

### Comment

BHP Billiton commissioned Ecologia (2008a) to conduct a flora and vegetation survey of the application area in 2008. Factors taken into consideration when determining the vegetation condition were: weeds, grazing, litter and ground disturbance (tracks and other cleared areas). Based on this survey the vegetation condition was derived.

## 3. Assessment of application against clearing principles

### (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments

#### Proposal may be at variance to this Principle

The application area is located within the Chichester subregion of the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The Chichester subregion is characterised by undulating granite and basalt plains with significant areas of basalt ranges. Plains support shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands, whilst *Eucalyptus leucophloia* tree steppes occur on ranges (Kendrick and McKenzie, 2002).

Ecologia (2008a) recorded 217 flora taxa from 37 families and 98 genera during a flora and vegetation survey of the rail corridor between Turner Camp and Spring Siding. Floristic richness was comparable to other areas in the Pilbara, as suggested by comparison to other vegetation and flora surveys in the bioregion. For example, 205 flora taxa from 35 families and 97 genera were recorded during the Walla to Turner Camp flora and vegetation survey (Ecologia, 2008d), an area of similar size and disturbance level. Eight vegetation units were described from four distinct landform types during the Turner Camp to Springs Siding survey, all of which are typical of vegetation units previously described for the Pilbara bioregion (Ecologia, 2008a). Vegetation condition of the proposed rail duplication area was rated as 'degraded' as a result of disturbance in the form of existing access tracks either side of the existing rail formation, large numbers of introduced flora species and grazing by cattle (Ecologia, 2008a).

Ecologia (2008a) recorded 66 flora taxa from 24 families and 46 genera during a flora and vegetation survey of the Rail Repeater Station Three lease area. Floristic richness was comparable to other areas in the Pilbara, as suggested by comparison to other vegetation and flora surveys in the bioregion. For example, 69 flora taxa were recorded at the Rail Repeater Station Two lease, an area of similar size and disturbance level. Four vegetation units were described from three distinct landform types at Rail Repeater Station Three, all of which are typical of vegetation units previously described for the Pilbara bioregion (Ecologia, 2008a). Vegetation condition of the Rail Repeater Station Three lease area was rated as 'good to excellent', with low levels of disturbance, few introduced flora species and limited evidence of grazing. However, a section was noted to have been burnt in the recent past (Ecologia, 2008a).

Ecologia (2008a) recorded 77 taxa from 28 families and 50 genera during a flora and vegetation survey of the Rail Repeater Station Four lease area. Floristic richness was comparable to other areas in the Pilbara (Ecologia, 2008a). Two vegetation units were described from one distinct landform types at Rail Repeater Station Four, both are typical of vegetation units previously described for the Pilbara bioregion (Ecologia, 2008a). Vegetation condition of the Rail Repeater Station Four lease area was generally rated as 'good to excellent', with minimal disturbance present from introduced flora species, grazing, tracks and litter (Ecologia, 2008a).

Desktop surveys revealed that 227 vertebrate fauna species may potentially occur within the application area (Ecologia, 2008b). Fauna diversity was comparable to other areas in the Pilbara, as suggested by other comparable fauna surveys in the bioregion. For example 212 vertebrate fauna taxa were recorded during the Walla to Turner Camp fauna survey (Ecologia, 2008d)

Based on the above, the proposed clearing may be at variance to this Principle.

Ecologia (2008b) concluded that the application area was largely comprised of land systems and vegetation types that are well represented both locally and regionally. There will be an unavoidable loss of biodiversity as a result of vegetation clearing for the proposed rail duplication. From a faunal perspective, Ecologia (2008b) report that no significant impacts to biodiversity are anticipated. Whilst a number of fauna species indigenous to Western Australia are expected to use habitat within the proposed clearing area, this is not considered significant habitat. Fauna habitats within the rail lease are generally degraded, subject to regular traffic from vehicles and trains and secondary impacts such as dust and noise (Ecologia, 2008b).

Desktop surveys revealed that there are seven introduced fauna species likely to occur in the application area: House Mouse (*Mus musculus*), Dog (*Canis lupus*), Dingo (*Canis lupus dingo*), Cat (*Felis catus*), Donkey (*Equus asinus*), Camel (*Camelus dromedaries*) and European Cattle (*Bos Taurus*). No feral species were recorded during the reconnaissance survey (Ecologia, 2008a). Introduced species are capable of out competing native fauna for food and shelter sources. Furthermore, larger carnivorous introduced species are likely to feed directly on native fauna, reducing the biodiversity of the area (Ecologia, 2008b)

No flora species listed as Declared plants under the *Agriculture and Related Resources Protection Act 1976* were recorded during the Turner Camp to Spring Siding survey while seven general environmental weeds were recorded (Ecologia, 2008a): Buffel Grass (*Cenchrus ciliaris*); Kapok Bush (*Aerva javanica*); Pigweed (*Portulaca oleracea*); Puncture Vine (*Tribulus terrestris*); Purpletop Chloris (*Chloris barbata*); Awnless Barnyard Grass (*Echinochloa colona*); and Mimosa Bush (*Vachellia farnesiana*). Kapok Bush and Buffel Grass occur almost continuously along the length of the proposed rail duplication at a cover of up to 10% and 70% respectively (Ecologia, 2008a). The remaining five introduced flora species were recorded at lower densities at various locations in the application area. In general, introduced species were common to the rail corridor and were typically confined to access tracks and disturbed areas at Rail Repeater Stations Three and Four (Ecologia, 2008a).

The presence of introduced species diminishes the biodiversity value of the proposed clearing area. Care needs to be taken to ensure that vehicles and machinery brought onto the Rail Lease and Rail Repeater Stations Three and Four leases do not introduce weeds to non-infested areas. Should a clearing permit be granted, it is recommended that appropriate conditions be imposed to minimise the risk of clearing operations spreading or introducing weeds to non-infested areas.

**Methodology** Ecologia (2008a)  
Ecologia (2008b)  
Ecologia (2008d)  
Kendrick and McKenzie (2002)

GIS Database:

- Interim Biogeographic Regionalisation for Australia (Subregions).

**(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.**

**Comments Proposal may be at variance to this Principle**

Ecologia (2008b) undertook a Level 1 vertebrate fauna assessment of the application area (Turner Camp to Springs Siding and Rail Repeater Stations Three and Four) in May 2008. The assessments involved desktop database searches and literature reviews prior to field reconnaissance in order to compile potential species inventories for the study sites (Ecologia, 2008b). The following databases and references were consulted by Ecologia (2008b):

- Western Australian Museum Faunabase;
- Birds Australia Birdata;
- Department of Environment and Conservation (DEC) Threatened Fauna database;
- Department of Environment and Water Protected Matters database; and
- other vertebrate fauna assessments in the local area, including several of the Newman – Port Hedland Mainline rail lease.

Desktop studies revealed that 227 vertebrate fauna species may potentially occur in the application area including 22 species of conservation significant fauna, comprising 14 species of rare fauna and eight species of migratory bird (Ecologia, 2008b).

Field reconnaissance of the proposed Turner Camp to Spring Siding duplication area and Rail Repeater Station Three and Four areas was undertaken between 8 and 12 May 2008 (Ecologia, 2008b). The main objectives of the field reconnaissance included:

- to provide a description of the main habitat types;
- to look for species of conservation significance;
- to undertake a risk assessment to determine likely impacts and threatening processes on vertebrate fauna; and
- to make recommendations to minimise impacts to fauna (Ecologia, 2008b).

Five major fauna habitats were identified from the proposed rail duplication area by Ecologia (2008b):

1. Sandy/rocky plain undulating plain with *Corymbia* low trees, *Acacia* high – low shrubs over moderately dense Spinifex;
2. Riverbed/bank with scattered *Eucalyptus*, *Acacia* and *Corymbia* trees over moderately dense tussock and hummock grasses and sedges;
3. Minor channel/creek line with scattered *Eucalyptus*, *Acacia* and *Corymbia* trees over moderately dense high shrub over mixed hummock and tussock grasses
4. Granite outcrop with moderately dense *Acacia* medium and low shrubs, over moderately dense Spinifex, open tussock and sparse sedges;
5. Undulating plain with scattered *Corymbia* low trees over open high and low shrubs, over moderately dense Spinifex and tussock grasses. Ridgetop with *Acacia* high shrubs over open mid to low shrubs with dense *Triodia* hummock grass; and

Three major fauna habitats were identified from the Rail Repeater Station Three lease area by Ecologia (2008b):

1. Granite outcrop with medium shrubs over sparse tussock and hummock grass;
2. Rocky hill slope with variable vegetation, some with scattered *Corymbia* and sparse shrubs while others with no trees but dense shrubs. Both with some hummock and or tussock grass; and
3. Rocky plain with open *Corymbia* tree and sparse shrubs over dense hummock and open tussock grasses.

Two major fauna habitats were identified from the Rail Repeater Station Four lease area by Ecologia (2008b):

1. Rocky hill slope/ridge top with high and low shrubs, dense Spinifex and sparse tussock grass; and
2. Creek bed/bank with open *Eucalyptus* and *Acacia* medium trees over open shrubs over sparse hummock and tussock grass.

Ecologia (2008b) concluded that the application area was largely comprised of land systems and vegetation types that are well represented both locally and regionally. There will be an unavoidable loss of biodiversity as a result of vegetation clearing for the proposed rail duplication. Loss of local vertebrate communities, loss of

ecological function, displacement of local fauna into surrounding areas (where they will face increased competition), mortality (during clearing or vehicle strike), noise, dust, accidental fire, and increases in feral fauna are all likely impacts of the proposed vegetation clearing and subsequent construction activities.

Fauna most likely to be impacted by the proposed vegetation clearing include highly territorial species which are unlikely to leave the impact footprint even if the habitat is cleared, young mammals and birds still under parental care and species relying on a specialised habitat type where there is no suitable habitat nearby (Ecologia, 2008b). Burrowing animals are also vulnerable to direct mortality during clearing operations, in addition to habitat loss, as they may be unlikely to vacate burrows if disturbed (Ecologia, 2008b). Fauna most likely to be impacted by this proposal are discussed below.

Northern Quolls (*Dasyurus hallucatus*) are listed as 'Endangered' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and as 'Schedule 1 - Fauna that is rare or likely to become extinct' in the *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*. They have been recorded at Quarry three approx five kilometres South-South-East of Turner Camp adjacent to the Turner Camp to Spring Siding rail corridor (Ecologia, 2008b). Given that the application area traverses some major water courses containing Eucalyptus and the nearby location of Quarry three it is possible that the Northern Quoll could venture into the application area transiently while foraging or looking for a mate (Ecologia, 2008b). Consequently the Northern Quoll is thought to have a medium likelihood of occurrence in the application area, but is unlikely to be resident (Ecologia, 2008b). The regional impact to this species is considered to be low as the species would use the corridor only in passage if at all, and much more suitable habitat is available elsewhere (Ecologia, 2008b).

BHP Billiton has developed a Northern Quoll Management Plan ("*Rail Expansion Project – Northern Quoll Management Plan - Revision 2*") in consultation with DEC and Department of Mines and Petroleum (DMP), to be implemented during the current Newman to Port Hedland rail duplication project.

Brush-tailed Mulgara (*Dasyercus blythi*) are listed as Priority 4 on the DEC's Threatened Fauna database. They occur across much of the arid interior of Western Australia where they excavate single-entranced burrows in Spinifex grassland usually on the flats between low dunes (Ecologia, 2008b). Two DEC records of the Brush-tailed Mulgara occur within seven kilometres of the application area (Ecologia, 2008b). During the reconnaissance survey a disused Mulgara burrow was identified within the application area, therefore, the Brush-tailed Mulgara is considered to have a medium likelihood of occurrence in the application area (Ecologia, 2008b). However, there is little suitable habitat within the application area and more suitable habitat is available adjacent, therefore, the regional impacts to this species are expected to be low (Ecologia, 2008b).

The Western Pebble-mouse (*Pseudomys chapmani*) is listed as Priority 4 on the DEC's Threatened Fauna database (Ecologia, 2008b). It is known to inhabit gentle slopes of rocky ranges where the ground is covered by stony mulch and is vegetated by hard spinifex, often with a sparse overstorey of Eucalypts and scattered shrubs, typically Senna, Acacia and Ptilotus (Ecologia, 2008b). Five DEC records place the Western Pebble-mouse within eight kilometres of the Turner Camp to Spring Siding rail corridor (Ecologia, 2008b). Ecologia (2008b) has also found evidence of the species during other surveys in the region. At Turner Camp an inactive mound was located and during the Walla to Turner rail corridor survey another inactive mound was located. No mounds were recorded during the reconnaissance survey of the Turner Camp to Spring Siding application area but the species may persist in some areas and is considered to have a medium likelihood of occurrence in the application area. Little suitable habitat is available within the application area (Ecologia, 2008b), therefore, it is unlikely the vegetation within the application area would represent significant habitat for this species.

The Australian Bustard (*Ardeotis australis*) is listed as Priority 4 on the DEC's Threatened Fauna database (Ecologia, 2008b). It is distributed across parts of New Guinea and most of Australia, favouring open or lightly wooded grassland, chenopod flats, low heathland and farming country (Ecologia, 2008b). It is a nomadic species and its abundance varies both locally and seasonally, largely according to the presence of grasshoppers to which it is attracted (Ecologia, 2008b). Two DEC records place the Australian Bustard directly next to the Turner Camp to Spring Siding rail corridor while there are another two more distant DEC records at 400 metres adjacent to the corridor (Ecologia, 2008b). The species has also been recorded at Fortescue Metals Group rail sites directly next to the rail corridor and also by Ecologia during a survey of the Turner Camp (Ecologia, 2008b). Given the large number of previous records and the variety of habitats utilised by the Australian Bustard, it is considered to have a high likelihood of occurrence in the project area as a transient visitor or breeding resident (Ecologia, 2008b). While the species may be present in the project area transiently it is a nomadic species that can move away from areas of disturbance (Ecologia, 2008b) and it is unlikely that the vegetation within the application area would represent significant habitat for this species.

Based on the above, the proposed clearing may be at variance to this Principle.

During the flora survey of the application area, Ecologia botanists noted that the vegetation condition within the 40 metre wide existing rail corridor was highly degraded and disturbed with significant weed populations, disturbance from access tracks, vehicle traffic which has caused significant dust build up on the plants lining the tracks, grazing in areas with good cattle feed, and litter in some parts of the rail corridor (Ecologia, 2008b). The Turner Camp to Spring Siding project area had also been affected by fires (Ecologia, 2008b). The degraded nature of much of the vegetation within the application area will reduce its importance as significant fauna habitat, as less degraded habitats occur within the near vicinity.

**(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.**

**Comments Proposal is not likely to be at variance to this Principle**

Ecologia (2008a) conducted a Level 1 flora and vegetation survey of the Mainline Rail Lease (80 metres wide, 60 kilometres long) between Turner Camp and Spring Siding (the application area) between 30 March and 4 April 2008. Further to this, Ecologia (2008a) conducted a flora and vegetation survey over two sites where the proposed Rail Repeater Stations will be built totalling 2.25 hectares each. Rail Repeater Stations Three and Four were surveyed on 3 April 2008 and 28 March 2008, respectively. These surveys were undertaken after summer rains to ensure that the flora recorded, accurately represents the floristic diversity of the region (Ecologia, 2008a).

According to available databases, there are no known records of Declared Rare Flora (DRF) or Priority Flora within the application area (Ecologia, 2008b).

Two DRF are known to occur in the Pilbara bioregion, *Lepidium catapycnon* and *Thryptomene wittweri*; neither of these taxa were recorded during the flora surveys (Ecologia, 2008a). These taxa are restricted to steep rocky slopes and ridges and the potential for their occurrence in, or in the vicinity of the survey area is considered to be low (Ecologia, 2008a).

Currently, 98 Priority Flora species are known from the Pilbara bioregion (Ecologia, 2008a). An examination of available databases and historic literature showed records of 17 Priority flora species which have the potential to occur within a 20 kilometre radius of the application area (Ecologia, 2008b).

Although there is potential for some priority flora species to occur within the application area, Ecologia (2008a) did not record any DRF or Priority Flora species during flora and vegetation surveys of the proposed rail duplication area, or the Rail Repeater Stations Three and Four leases.

The vegetation communities present within the proposed clearing area are typical of those found within the Chichester subregion, as described by Kendrick and McKenzie (2001) and Beard (1975; cited in Ecologia, 2008a). It is not expected that the proposed clearing will result in a loss of significant habitat necessary for the continued existence of DRF or Priority Flora species.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

**Methodology** Ecologia (2008a)  
Ecologia (2008b)  
Kendrick and McKenzie (2001)

**(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.**

**Comments Proposal is not likely to be at variance to this Principle**

According to available databases there are no Threatened Ecological Communities (TEC's) within the application area (GIS Database). The nearest TEC is located approximately 110 kilometres to the south-west (GIS Database).

The vegetation units described by Ecologia (2008a) within the application area were not considered to be TEC's or an ecological community at risk.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

**Methodology** Ecologia (2008a)  
GIS Database:  
-Threatened Ecological Communities

**(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.**

**Comments Proposal is not at variance to this Principle**

The application area is within the Interim Biogeographic Regionalisation for Australia (IBRA) Pilbara bioregion (GIS Database). According to Shepherd et al. (2001) there is approximately 99.9% of the pre-European vegetation remaining in the Pilbara bioregion. The vegetation of the application area is classified as Beard vegetation association 93 - Hummock grasslands, shrub steppe; kanji over soft Spinifex and Beard vegetation association 619 - Medium woodland; River Gum (*Eucalyptus camaldulensis*) (GIS Database).

There is approximately 100% of the pre-European vegetation remaining of Beard Vegetation Associations 93 and 619 in the Pilbara bioregion (Shepherd et al., 2001). These vegetation types are poorly represented within

conservation reserves at both the state and bioregional level (see table below). The application area does not represent a significant remnant of vegetation in the wider regional area. The proposed clearing will not reduce the extent of Beard Vegetation Associations 93 or 619 below current recognised threshold levels, below which species loss increases significantly.

It is acknowledged that iron ore mining activities in the Pilbara have resulted in an increase of native vegetation clearing at the bioregional scale in recent years. This trend is expected to continue with proposed BHP Billiton and Rio Tinto expansion projects. It will therefore become increasingly important in the future to consider the cumulative impacts of native vegetation clearing both locally and regionally.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion – Pilbara	17,804,164	17,794,651	~99.9	least concern	6.3
Beard veg assoc. – State					
93	3,044,326	3,044,267	~100	least concern	0.4
619	119,159	119,038	~100	least concern	0.2
Beard veg assoc. – Bioregion					
93	3,042,131	3,042,082	~100	least concern	0.4
619	118,706	118,706	~100	least concern	0.2

\* Shepherd et al. (2001) updated 2005

\*\* Department of Natural Resources and Environment (2002)

Based on the above, the proposed clearing is not at variance to this Principle.

**Methodology** Department of Natural Resources and Environment (2002)  
Shepherd et al. (2001)  
GIS Databases:  
- Interim Biogeographic Regionalisation of Australia  
- Pre-European Vegetation

**(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.**

**Comments Proposal is at variance to this Principle**

According to available databases, there are no known Australia Nature Conservation Agency (ANCA) wetlands or Ramsar wetlands within the application area (GIS Database).

The application area crosses Edgina Creek, Yule River, Two Camel Creek, Coonarie Creek and a number of minor drainage lines (Ecologia, 2008a). Six distinct vegetation units associated with watercourses were identified by Ecologia (2008a) during a flora and vegetation survey of the proposed rail duplication area:

1. Sandy/Rocky Undulating Plain - Scattered *Corymbia hamersleyana* low trees, over scattered *Acacia trudgeniana* and *A. inaequilatera* high shrubs, over scattered medium to low shrubs of *A. bivenosa*, *A. orthocarpa* and *A. stellaticeps*, over moderately dense varying *Triodia longiceps*, *T. lanigera*, *T. angusta* and *T. epactia* hummock grasses, with sparse patches of *Aristida contorta*, *Cenchrus ciliaris* (weed) and *Eriachne lanata* tussock grass;

2. River Bed/Bank - Open to moderately dense *Eucalyptus camaldulensis* var. *obtusa*, *E. victrix* and *Melaleuca argentea* medium trees, over moderately dense mixed *Acacia ampliceps* and *Erythrina vespertilio* low trees, over open mixed *Acacia ampliceps*, *A. trachycarpa*, *A. colei* var. *colei*, *Melaleuca glomerata* and *M. linophylla* high to medium shrubs, over moderately dense *Cenchrus ciliaris* (weed) and open *Triodia angusta* hummock grasses, with open *Cyperus blakeanus* or *Cyperus ixiocarpus* sedges;

3. Minor Channel/Creepline - Scattered *Eucalyptus camaldulensis* var. *obtusa*, *Acacia coriacea* subsp. *pendens* and *Corymbia hamersleyana* low trees, over mixed open to moderately dense *A. trachycarpa*, sometimes with *A. ampliceps*, *A. acradenia* and *A. pyriformis* high shrubs, over open *Triodia lanigera*, *T. angusta*, *T. basedowii* and *T. epactia* hummock grasses, with scattered patches of *Cenchrus ciliaris* (weed);

4. Minor Channel/Creepline - Scattered *Corymbia hamersleyana* low trees, over moderately dense *Petalostylis labicheoides* and *Acacia acradenia* high to medium shrubs, over open mixed *Cenchrus ciliaris* (weed) and *Triodia epactia* and *T. angusta* hummock grasses;

5. Minor Channel/Creepline - Scattered *Corymbia hamersleyana* low trees, over sparse *Acacia bivenosa* high shrubs, over moderately dense mixed *Adriana urticoides* var. *urticoides* and *Pluchea ferdinandi-muelleri* medium to low shrubs, over moderately dense *Cenchrus ciliaris* (weed), with sparse *Triodia secunda* hummock

grass; and

6. Minor Channel/Creekline - Moderately dense *Acacia tumida* var. *tumida* and *Grevillea wickhamii* high shrubs, over open *Cajanus cinereus* medium shrubs, over sparse mixed *Aerva javanica* (weed) and *Indigofera monophylla* low shrubs, over open *Triodia epactia* hummock and open mixed tussock grasses, dominated by *Perotis rara*.

The application area intersects vegetation unit 3 at Yule River, Two Camel Creek and Coonarie Creek. Approximately two hectares of this vegetation unit is proposed to be cleared for the construction of the new Coonarie Creek Bridge. Vegetation units 4, 5, 6 and 7 are intersected at numerous minor drainage lines and vegetation unit 2 is intersected by an access track leading to Rail Repeater Station Four. In total eight hectares of vegetation associated with drainage lines is proposed to be cleared (Ecologia, 2008a)

Based on the above, the proposed clearing is at variance to this Principle.

Riparian vegetation associated with the Rivers Land System described by Van Vreeswyk et al. (2004) has a relatively small total area, however, its distribution is quite widespread throughout the Pilbara along numerous creeks and rivers. Ecologia (2008a) states that the vegetation, including riparian vegetation, of the Turner Camp to Spring Siding is typical of vegetation previously described for the Pilbara area. Therefore, the loss of a small percentage of this riparian vegetation is not expected to have a large environmental impact.

In addition, much of the vegetation of the application area has been highly degraded. Ecologia (2008a and 2008b) report that the vegetation along the rail corridor is generally degraded as a result of disturbance from the construction of the original rail corridor, which has resulted in the introduction of a high numbers of weeds.

The proponent has been advised that it is their responsibility to liaise with the Department of Water to determine whether a Bed and Banks Permit, or any other licences or approvals are required for the proposed

**Methodology** Ecologia (2008a)  
Ecologia (2008b)  
Van Vreeswyk et al. (2004)  
GIS Database:  
-ANCA wetlands  
-RAMSAR wetlands

**(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.**

**Comments Proposal may be at variance to this Principle**

Land system mapping by the Department of Agriculture Western Australia has mapped a variety of land systems for the Pilbara bioregion. Land systems are mapped based on biophysical features such as soil and landform type, geology, geomorphology and vegetation type (Van Vreeswyk et al., 2004). The proposed clearing areas include three different land systems (GIS Database). A broad description of each land system is given below:

1. Macroy - The Macroy land system is characterised by stony plains and occasional tor fields based on granite supporting hard and soft spinifex grasslands. This land system has low or very low erosion hazard (Van Vreeswyk et al., 2004). Approximately 454 hectares of the application area is within this land system (Ecologia, 2008a).

2. River - The River land system is characterised by active flood plains and major rivers supporting grassy Eucalypt woodlands, tussock grasslands and soft Spinifex grasslands. This land system is largely stabilised by Buffel Grass and Spinifex, therefore, accelerated erosion is uncommon. However, susceptibility to erosion is high or very high if vegetative cover is removed (Van Vreeswyk et al., 2004). Approximately eight hectares of the application area is within this land system (Ecologia, 2008a).

3. Granitic - The Granitic land system is characterised by hill tracts and domes on granitic rocks and rough crests with associated rocky hill slopes and restricted lower stony plains. The system is subject to fairly frequent burning and is not susceptible to erosion (Van Vreeswyk et al., 2004). Approximately 20 hectares of the application area is within this land system (Ecologia, 2008a)

Based on the above, the proposed clearing may be at variance to this Principle.

The proponent will implement the following strategies to minimise land degradation risks associated with vegetation clearing (BHP Billiton, 2008):

- All cleared vegetation will be stockpiled for later use in rehabilitation. To minimise disturbance, stockpiles will be located on previously cleared or disturbed areas where practicable;
- Topsoil will be stripped to a depth of 50 - 100 millimetres and stockpiled to a height no greater than 1.5 metres for later use in rehabilitation. To minimise disturbance, stockpiles will be located on previously cleared or disturbed areas where practicable;



- Borrow pits will be progressively rehabilitated, whilst laydown areas will be rehabilitated post construction;
- Surface water run-off from work areas shall be contained in sumps to prevent pollution and erosion. Sumps shall be filled and rehabilitated upon completion of works. Bunding will also be used where necessary to prevent sediment releases off site;
- A total of 71 culverts will be installed where the rail formation crosses minor drainage lines and areas of concentrated surface runoff. Culverts have been engineered to have sufficient capacity to accommodate flow along existing drainage lines from 1 in 50 year flood event (Ecologia, 2008a). Rock protection is provided as a general specification in culvert design, and will be used in all culverts installed during construction; and
- Where the potential for erosion is high, appropriate methods for erosion control will be used (such as gabions, rip rap rock protection and reno mattresses). Post construction quality assurance monitoring will identify any additional erosion control which may be required (Ecologia, 2008a).

**Methodology** BHP Billiton (2008)  
Ecologia (2008a)  
Van Vreeswyk et al. (2004)  
GIS Database  
- Rangeland land system mapping.

**(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.**

**Comments Proposal is not likely to be at variance to this Principle**

There are no conservation reserves in close proximity to the application area (GIS Database). The nearest known conservation reserve is the Mungaroon Range Nature Reserve, located approximately 30 kilometres west of the southern extent of the proposed rail duplication area (GIS Database).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

**Methodology** GIS Database:  
- CALM Managed Lands and Waters

**(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.**

**Comments Proposal is not likely to be at variance to this Principle**

A number of ephemeral drainage lines dissect the proposed rail duplication area, including Edgina Creek, Yule River, Two Camel Creek, Coonarrie Creek (Ecologia, 2008a). It is proposed that one new dual track rail bridge will be constructed to cross Coonarrie Creek, whilst 71 existing culverts will be extended beneath the proposed rail duplication (BHP Billiton, 2008). These engineering structures will ensure natural surface water flow regimes are reinstated following duplication of the railway line. Communicating

During clearing, there is a potential for surface water quality to be impacted by sedimentation should adequate management measures not be put in place. BHP Billiton will implement the following strategies to avoid, minimise and mitigate impacts to surface water quality (Ecologia, 2008a):

- Surface water run-off from work areas shall be contained in sumps. Bunding will also be used where necessary to prevent sediment releases off site;
- Where the potential for erosion is high, appropriate methods for erosion control will be used (such as gabions, rip rap rock protection and reno mattresses). Designers for the civil works will determine erosion potential based on floodway reports and standard engineering experience. Rock protection is provided as a general specification in culvert design, and will be used in all culverts installed during construction. Post construction quality assurance monitoring will identify any additional erosion control which may be required;
- Topsoil and cleared vegetation shall be stockpiled away from watercourses; and
- Contractors shall maintain a minimum 50 metre set back from drainage lines for disturbances unless otherwise approved.

The proposed clearing area is not located within a Public Drinking Water Source Area (GIS Database). The majority of the proposed vegetation clearing is within a linear, 80 metre wide rail corridor spanning some 60 kilometres. It is unlikely that vegetation clearing would result in any significant changes to local groundwater levels or quality.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

**Methodology** BHP Billiton (2008)  
Ecologia (2008a)  
GIS Database:  
-Public Drinking Water Source Area

**(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.**

**Comments Proposal is not likely to be at variance to this Principle**

Geoscience Australia (2008) attributes four major factors which influence inland flooding. These include:

- Intensity and duration of rainfall over a catchment area;
- The capacity of the watercourses to network and convey runoff;
- The percentage of vegetation cover; and
- The topography.

Based on the four factors listed above, clearing within the application area is unlikely to exacerbate or increase the incidence or intensity of flooding for the following reasons:

- The application area has a climate with a summer predominant rainfall pattern averaging approximately 180 millimetres per annum (Ecologia, 2008b), and a high average annual evaporation rate exceeding the average annual rainfall by nearly twenty times (approximately 3,600 millimetres) (GIS Database);
- The application area stretches over the Yule River and Turner River catchments. These catchments total 886,078 and 480,185 hectares respectively (GIS Database). Although the application area is relatively large (358 hectares), when compared in relation to the large size of the two catchments, it is unlikely to result in an appreciable increase in runoff. Furthermore, where the rail corridor crosses rivers and drainages lines, bridges and culverts will be installed and engineered to withstand a 1 in 50 year rainfall event (BHP Billiton, 2008);
- Vegetation cover immediately surrounding the application area is high, with nearly 99 percent of the pre-European vegetation remaining (Shepherd et al., 2001), slowing water movements to lower lying areas and increasing water infiltration and absorption; and
- The topography of the application area slowly descends from 310 metres above sea level in the south to 220 metres in the north (90 metre drop over 60 kilometres) (GIS Database). Water movements across the application area during significant rainfall events are expected to be slow allowing infiltration and reducing rapid mass transition of water to lower areas.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

**Methodology** BHP Billiton (2008)  
Geoscience Australia (2008)  
Shepherd et al. (2001)  
GIS Database:  
- Evaporation Isopleths  
- Hydrographic Catchments  
- Rainfall, Mean Annual  
- Topography Contours, Statewide

**Planning instrument, Native Title, Previous EPA decision or other matter.**

**Comments**

There are four native title claims over the application area (GIS Database). These claims (WC99\_003, WC99\_008, WC95\_053 and WC99\_016) have been registered with the National Native Title Tribunal on behalf of the claimant groups (GIS Database). However, the mining tenements have been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are numerous registered Sites of Aboriginal Significance within two kilometres of the proposed clearing areas (GIS Database). The proposed clearing intersects the buffer zone of eleven of these sites (BHP Billiton, 2008). Recent heritage surveys have been undertaken by the traditional owners of the land, confirming that there are no registered Sites within the proposed clearing areas (BHP Billiton, 2008). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance

are damaged through the clearing process.

A submission was received from the Town of Port Hedland stating that they do not support the application because a planning application was not received. The assessing officer contacted BHP regarding this issue and was provided with documents which show that BHP was exempt from this process.

It is the proponent's responsibility to liaise with the Department of Environment and Conservation and the Department of Water to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

**Methodology** BHP Billiton (2008)  
GIS Databases:  
- Aboriginal Sites of Significance  
- Native Title Claims

#### 4. Assessor's comments

##### Comment

The proposal has been assessed against the clearing principles and is at variance to Principle (f), may be at variance to Principles (a), (b), and (g), is not likely to be at variance to Principles (c), (d), (h), (i) and (j) and is not at variance to Principle (e).

Should a clearing permit be granted, it is recommended that conditions be imposed on the permit for the purposes of weed management, record keeping and permit reporting.

#### 5. References

- BHP Billiton (2008) Turner Camp to Springs Siding Rail Duplication Project, Application to Clear Native Vegetation (Purpose Permit) Under the *Environmental Protection Act 1986*, unpublished report Perth Western Australia.
- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
- Ecologia (2008a) Turner Camp to Springs Siding and Rail Repeater Stations Three and Four Flora Report, unpublished report for BHP Billiton.
- Ecologia (2008b) Turner Camp to Springs Siding and Rail Repeater Stations Three and Four Fauna Report, unpublished report for BHP Billiton.
- Ecologia (2008c) Rail Expansion Project Northern Quoll Management Plan. Revision 2. October 2008. Unpublished report for BHP Billiton Iron Ore Pty Ltd.
- Ecologia (2008d) Walla Siding South to Turner Camp Rail Duplication Project. Application to clear native vegetation (Purpose Permit) under the *Environmental Protection Act 1986*. Unpublished report for BHP Billiton Iron Ore Pty Ltd.
- Geoscience Australia (2008) What Causes Floods, Electronic source of information, viewed 15 September 2008, <http://www.ga.gov.au/hazards/flood/causes.jsp>.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Kendrick, P. and McKenzie, N. (2002) Pilbara 1 (PIL1 - Chichester subregion) in 'A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002'. Department of Conservation and Land Management, Western Australia.
- Shepherd, D.P. (2007). Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth. Includes subsequent updates for 2006 from Vegetation Extent dataset ANZWA1050000124.
- Van Vreeswyk, A.M, Payne, A.L, Leighton, K.A & Hennig, P (2004) Technical Bulletin No. 92: An inventory and condition survey of the Pilbara region, Western Australia. Department of Agriculture, South Perth, Western Australia.

#### 6. Glossary

##### Acronyms:

<b>BoM</b>	Bureau of Meteorology, Australian Government.
<b>CALM</b>	Department of Conservation and Land Management, Western Australia.
<b>DAFWA</b>	Department of Agriculture and Food, Western Australia.
<b>DA</b>	Department of Agriculture, Western Australia.
<b>DEC</b>	Department of Environment and Conservation
<b>DEH</b>	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
<b>DEP</b>	Department of Environment Protection (now DoE), Western Australia.
<b>DIA</b>	Department of Indigenous Affairs
<b>DLI</b>	Department of Land Information, Western Australia.
<b>DoE</b>	Department of Environment, Western Australia.

<b>DoIR</b>	Department of Industry and Resources, Western Australia.
<b>DOLA</b>	Department of Land Administration, Western Australia.
<b>DoW</b>	Department of Water
<b>EP Act</b>	Environment Protection Act 1986, Western Australia.
<b>EPBC Act</b>	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
<b>GIS</b>	Geographical Information System.
<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia.
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
<b>RIWI</b>	Rights in Water and Irrigation Act 1914, Western Australia.
<b>s.17</b>	Section 17 of the Environment Protection Act 1986, Western Australia.
<b>TECs</b>	Threatened Ecological Communities.

### **Definitions:**

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005*. Department of Conservation and Land Management, Como, Western Australia} :-

- P1** **Priority One - 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.
- P2** **Priority Two - 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.
- P3** **Priority Three - Poorly Known taxa:** taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
- P4** **Priority Four – Rare taxa:** taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
- R** **Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):** 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, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
- X** **Declared Rare Flora - Presumed Extinct taxa:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-

- Schedule 1** **Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
- Schedule 2** **Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
- Schedule 3** **Schedule 3 – Birds protected under an international agreement:** being birds that 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 need of special protection.
- Schedule 4** **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

{CALM (2005). *Priority Codes for Fauna*. Department of Conservation and Land Management, Como, Western Australia} :-

- P1** **Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2** **Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P3** **Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P4** **Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed,

or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.

**P5** **Priority Five: Taxa in need of monitoring:** Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

**Categories of threatened species (*Environment Protection and Biodiversity Conservation Act 1999*)**

**EX** **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.

**EX(W)** **Extinct in the wild:** A native species which:  
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or  
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

**CR** **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.

**EN** **Endangered:** A native species which:  
(a) is not critically endangered; and  
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.

**VU** **Vulnerable:** A native species which:  
(a) is not critically endangered or endangered; and  
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

**CD** **Conservation Dependent:** A native species which 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.