



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 3776/1  
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, Mineral Lease 244SA (AML 70/244)  
Local Government Area: Shire of East Pilbara  
Colloquial name: Orebody 35 Project

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
100		Mechanical Removal	Mineral Exploration

## 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 scale of 1:250,000 for the whole of Western Australia. Two Beard Vegetation Associations are located within the application area (Shepherd, 2007):

**Beard Vegetation Association 18:** low woodland; Mulga (*Acacia aneura*); and

**Beard Vegetation Association 82:** hummock grasslands, low tree steppe; Snappy Gum over *Triodia wiseana*.

ENV Australia conducted a flora and vegetation survey over an 844 hectare area that included the application area in December 2009. This survey recorded the following vegetation associations within the application area (ENV Australia, 2010):

##### **Triodia Open Hummock Grassland**

**Vegetation Unit 1:** Open Hummock Grassland of *Triodia pungens* and *Triodia* sp. Shovelanna Hill with Open Shrubland of *Acacia sibirica*, *Acacia kempeana* and *Acacia aneura* var. *conifera* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* on Red-Brown Loam on Hillslopes.

##### **Vegetation Unit 2:**

Open Hummock Grassland of *Triodia* sp. Shovelanna Hill, *Triodia pungens* and *Triodia brizoides* with Low Open Shrubland of *Acacia adoxa* var. *adoxo*, *Acacia bivenosa* and *Acacia sibirica* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia deserticola* on Red-Brown Loam on Hillslopes.

##### **Vegetation Unit 3:**

Open Hummock Grassland of *Triodia* sp. Shovelanna Hill and *Triodia pungens* with Open Shrubland of *Acacia bivenosa*, *Acacia ancistrocarpa* and *Acacia pruinocarpa* with Scattered Mallees of *Eucalyptus gamophylla* on Red-Brown Loam on Plains.

##### **Vegetation Unit 4:**

Very Open Hummock Grassland of *Triodia pungens* and *Triodia brizoides* with Open Shrubland of *Dodonaea pachyneura*, *Acacia hamersleyensis* and *Acacia pruinocarpa* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* on Red-Brown Loam on Gorges.

##### **Acacia Shrubland**

##### **Vegetation Unit 5:**

High Open Shrubland of *Acacia aneura* var. *tenuis*, *Acacia rhodophloia* and *Acacia catenulata* subsp. *occidentalis* with Very Open Hummock Grassland of *Triodia pungens* and *Triodia brizoides* with Open Shrubland of *Acacia tetragonophylla*, *Acacia aneura* var. *conifera* and *Eremophila forrestii* subsp. *forrestii* on Red-Brown Loam on Plains.

##### **Vegetation Unit 6**

High Shrubland of *Acacia aneura* var. *pilbarana* and *Acacia paraneura* with Very Open Tussock Grassland of *Aristida inaequiglumis* and *Cenchrus ciliaris* with Low Scattered Shrubs of *Solanum lasiophyllum* on Red-Brown Loam on Plains.

##### **Vegetation Unit 7:**

High Shrubland of *Acacia citrinoviridis*, *Acacia aneura* var. *pilbarana* and *Acacia pyrifolia* with Open Tussock Grassland of *Cenchrus ciliaris*, *Themeda triandra* and *Chrysopogon fallax* with Low Open Woodland of *Corymbia candida* subsp. *dipsodes*, *Eucalyptus victrix* and *Corymbia hamersleyana* on Red-Brown Clay Loam on Major Drainage Lines.

**Vegetation Unit 8:**

High Shrubland of *Acacia aneura* var. *tenuis*, *Acacia aneura* var. *conifera* and *Acacia aneura* var. *aneura* with Very Open Hummock Grassland of *Triodia pungens* and *Triodia* sp. Shovelanna Hill with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Eucalyptus gamophylla* (Mallee) on Red-Brown Clay Loam on Floodplains.

**Vegetation Unit 9:**

Shrubland of *Acacia maitlandii* with Very Open Hummock Grassland of *Triodia* sp. Shovelanna Hill with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia deserticola* subsp. *deserticola* on Skeletal Red-Brown Clay Loam on Floodplains.

**Cenchrus Tussock Grassland****Vegetation Unit 10:**

Tussock Grassland of *Cenchrus ciliaris* and *Themeda triandra* with High Open Shrubland of *Acacia citrinoviridis* and *Acacia aneura* var. *conifera* with Low Open Woodland of *Eucalyptus* sp., *Corymbia hamersleyana* and *Corymbia candida* subsp. *dipsodes* on Red-Brown Clay Loam on Floodplains.

**Clearing Description**

BHP Billiton Iron Ore Pty Ltd (BHP Billiton) proposes to clear up to 100 hectares of native vegetation, within an area totalling approximately 517.68 hectares (BHP Billiton, 2010). The application area is located approximately 7 kilometres south-west of Newman (GIS Database).

The purpose of the proposed clearing is for exploration drilling and access tracks (BHP Billiton, 2010). Vegetation will be cleared by bulldozer or excavator and vegetation and topsoil will be stockpiled for rehabilitation purposes (BHP Billiton, 2010).

**Vegetation Condition**

Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994);

to

Pristine: No obvious signs of disturbance (Keighery, 1994).

**Comment**

The vegetation condition rating is derived from a flora and fauna assessment conducted by ENV Australia (2010). It was considered that the majority of the application area was in excellent condition (ENV Australia, 2010).

### 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 Hamersley subregion of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). The Hamersley subregion is described by CALM (2002) as being rich in *Acacia*, *Triodia*, *Ptilotus* and *Sida* species.

A flora and vegetation survey was conducted by ENV Australia in December 2009, over an approximately 844 hectare area, which included the application area. ENV Australia (2010) identified a total of 189 plant taxa, comprising 37 families and 86 genera, within the survey area. The dominant plant families have been reported by ENV Australia (2010) as being *Mimosaceae* (31 taxa), *Poaceae* (23 taxa) and *Malvaceae* (22 taxa). ENV Australia (2010) considers that the species richness within the survey area is not considered to represent a high level of biological diversity.

A Priority 3 flora species; *Tephrosia* sp. Pilbara Ranges was recorded within the survey area; however, not within the application area (ENV Australia, 2010). The taxon of this species has changed since this survey was conducted from *Tephrosia* sp. Pilbara Ranges to *Tephrosia* sp. Cathedral Gorge (Western Australian Herbarium, 1998-). *Tephrosia* sp. Cathedral Gorge is not a threatened flora species (Western Australian Herbarium, 1998-).

ENV Australia (2010) has identified three weed species within the application area; Buffel Grass (*Cenchrus ciliaris*), Beggartick (*Bidens bipinnata*) and Spiked Malvastrum (*Malvastrum americanum*). The presence of introduced weed species lowers the biodiversity value of the proposed clearing area. It is important to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. The risk of spreading weed species can be mitigated by imposing a condition for the purpose of weed management.

The vegetation and landforms within the application area are well represented within the region (ENV Australia, 2010). No Declared Rare Flora, Priority Flora, Threatened Ecological Communities or Priority Ecological Communities were recorded within the application area during the flora and vegetation survey (ENV Australia, 2010).

A fauna assessment was conducted by ENV Australia in December 2009, over an approximately 844 hectare area that included the application area. ENV Australia (2010) conducted a desktop review of previous surveys and available databases, in addition to a field assessment. The desktop and field assessments identified 276 fauna species from 176 genera and 73 families within the search area (ENV Australia, 2010). These results indicate that the application area is potentially high in fauna diversity.

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

**Methodology** CALM (2002)  
ENV Australia (2010)  
Western Australian Herbarium (1998-)  
GIS Database  
- IBRA WA (Regions-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**

In December 2009, ENV Australia conducted a fauna assessment of an 844 hectare area that included the application area. This assessment included a desktop review in addition to a field survey (ENV Australia, 2010). This assessment identified the following fauna habitats within the application area (ENV Australia, 2010):

**Gully Habitat**

This habitat type is of high habitat value due to the large array of microhabitats for fauna species to exploit, such as, caves, rock crevices, leaf litter and logs (ENV Australia, 2010). Gullies can be comparably diverse habitat in the Pilbara, providing areas for refuge, foraging and shelter (ENV Australia, 2010). Gullies provide nests and dens to a number of conservation significant fauna species, particularly mammals such as bats (ENV Australia, 2010). This habitat type is also suitable for the Pilbara Olive Python which normally resides near permanent water bodies in large gorges and gullies (ENV Australia, 2010). It is reported by ENV Australia (2010) that the Pilbara Olive Python would only be present in this habitat on an infrequent basis due to the lack of permanent waterbodies.

**Breakaway Habitat**

This habitat is considered of high habitat value, as it provides similar microhabitats for fauna as the gully habitat type as well as having low representation in the project area (ENV Australia, 2010). The rocky ground however, provides little refuge for burrowing fauna, and restricts the complexity of the vegetation structure (ENV Australia, 2010). Caves are often found within breakaway habitats which can provide refuge and shelter for Ghost Bats (ENV Australia, 2010). No large caves suitable for breeding were recorded within the project area, however, numerous small caves and crevices were observed that could be used as day roosts by the bats (ENV Australia, 2010).

**Alluvial Plain Habitat**

The alluvial plain habitat is considered to be of moderate habitat value (ENV Australia, 2010). The build-up of vegetation debris provides an abundance of microhabitats such as fallen timber and leaf litter that can be utilised by terrestrial and arboreal fauna (ENV Australia, 2010). This habitat may support fauna of conservation significance such as the Bush-stone Curlew and the Australian Bustard (ENV Australia, 2010). Despite the vegetation complexity and comparative level of biodiversity, this habitat type is quite well represented within the project area and this therefore determines this habitat to be of moderate value (ENV Australia, 2010).

**Scree Slope Habitat**

This habitat is considered to be of moderate habitat value (ENV Australia, 2010). The rock crevices and grasses in this habitat provide microhabitats to a limited number of ground-dwelling reptiles and mammals (ENV Australia, 2010). The vegetation is of low complexity with little overstorey and midstorey vegetation. The Western Pebble-mound Mouse has a preference for this habitat type and may use it in the project area (ENV Australia, 2010). During the survey three extinct pebble-mounds and one recently inactive pebble-mound were recorded in this habitat type (ENV Australia, 2010). The rocky substrate of this habitat is unsuitable for other burrowing species of mammals while the lack of tall shrubs is unsuitable for arboreal fauna (ENV Australia, 2010).

**Drainage Line Habitat**

This drainage line habitat is considered of medium habitat value because of the range of microhabitats present (ENV Australia, 2010). This habitat type often provides hollow branches, logs and detritus build-up from past floods for fauna to exploit, as well as soft soils suitable for burrowing animals (ENV Australia, 2010). The vegetation structure is also complex, providing shelter and foraging opportunities (ENV Australia, 2010). Ground dwelling and burrowing reptiles and mammals and nesting bird species are often found foraging and sheltering in these drainage lines (ENV Australia, 2010). Furthermore, well vegetated drainage lines can serve as important corridors for fauna movement by connecting otherwise isolated habitat types (ENV Australia, 2010).

**Hill Crest Habitat**

This habitat is considered to have low habitat value, as it provides limited microhabitat for fauna to exploit as well as being well represented in the study area (ENV Australia, 2010). This habitat type generally has a vegetation structure that is very simple, consisting of sparse shrubs over grasses (ENV Australia, 2010). Consequently, the number of arboreal lizards and bird species in these habitats is restricted, as is (to a lesser extent) the number of ground dwelling reptiles and mammals likely to be found in this habitat (ENV Australia, 2010).

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

ENV Australia (2010) reports that the landforms and habitat types within the project area are well represented in the Pilbara bioregion. Furthermore, ENV Australia (2010) did not identify any significant or unique habitat required for the conservation of rare or endangered fauna. Given the representation of these habitat types within the Pilbara bioregion, the vegetation of the application area is unlikely to represent significant habitat for any fauna species.

**Methodology** ENV Australia (2010)

**(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**

In December 2009, ENV Australia conducted a flora assessment of an approximately 844 hectare area that included the application area. The assessment included a desktop review that analysed previous surveys in the area and databases such as the Department of Environment and Conservation's (DEC's) NatureMap database, amongst others (ENV Australia, 2010). A field survey was undertaken from 11 to 14 December 2009 (ENV Australia, 2010). The following field survey methods were utilised by ENV Australia (2010):

- Twenty eight 50 x 50 metre quadrats and one releve were executed in the project area. Quadrats were selected as being representative of the flora and vegetation of the project area.
- Habitats within the project area that potentially support Declared Rare Flora (DRF) and/or Priority Flora species identified by the DEC database search were targeted and searched.

No DRF species were recorded within the survey area during the flora and fauna assessment (ENV Australia, 2010).

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

**Methodology** ENV Australia (2010)

**(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**

There are no known Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) within the area applied to clear (GIS Database). The nearest known TEC is located approximately 20 kilometres north-east of the application area (GIS Database).

ENV Australia (2010) reports that no TECs or PECs were identified within the application area during the flora and vegetation survey.

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

**Methodology** ENV Australia (2010)  
GIS Database  
- Threatened Ecological Sites

**(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 falls within the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). Shepherd (2007) reports that approximately 99.9% of the pre-European vegetation still exists within the Pilbara bioregion (see table below). The vegetation within the application area is recorded as the following Beard Vegetation Associations (Shepherd, 2007):

**Beard Vegetation Association 18:** low woodland; Mulga (*Acacia aneura*); and  
**Beard Vegetation Association 82:** hummock grasslands, low tree steppe; Snappy Gum over *Triodia wiseana*.

According to Shepherd (2007) approximately 100% of these vegetation associations remain within the bioregion (see table below).

The vegetation within the application area is not a remnant of native vegetation within an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,804,188	17,794,647	~99.9	Least Concern	~6.3
Beard vegetation associations - State					
18	19,892,305	19,890,195	~100	Least Concern	~2.1
82	2,565,901	2,565,901	~100	Least Concern	~10.2
Beard vegetation associations - Bioregion					
18	676,557	676,557	~100	Least Concern	~16.8
82	2,563,583	2,563,583	~100	Least Concern	~10.2

\* Shepherd (2007)

\*\* 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 (2007)  
GIS Database  
- IBRA WA (Regions-Subregions)

**(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 permanent watercourses within the application area, however, there are numerous minor, ephemeral watercourses and one major ephemeral watercourse (GIS Database). These watercourses are only likely to flow following significant rainfall (ENV Australia, 2010).

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

Vegetation descriptions provided by ENV Australia (2010) indicate that Vegetation Unit 7 is associated with a major ephemeral drainage line. Furthermore, ENV Australia (2010) reports that this vegetation association was in very good to excellent condition with several weed species noted. A weed management condition would help maintain the quality of vegetation within this watercourse.

ENV Australia (2010) reports that this vegetation association is typical of the Eastern Pilbara region and is reasonably common on a local scale, which is supported by aerial imagery and available databases (GIS Database). BHP Billiton (2010) states that drilling will not occur in major drainage channels or within a 20 metre buffer from the boundary of riparian vegetation. Wherever practicable, BHP Billiton (2010) will not encroach within 10 metres of minor drainage lines that may be considered significant in relation to local and/or regional surface flow. Furthermore, BHP Billiton (2010) have developed an Exploration Environmental Management Plan that states that preference will be given for the selection of drill sites where there is a low level of vegetation and is a suitable distance from any natural drainage course.

**Methodology** BHP Billiton (2010)  
ENV Australia (2010)  
GIS Database  
- hydrography, linear  
- Newman\_2003\_50cm-Orthomosaic-Landgate 2003

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

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

The application area has been mapped as occurring within the Boolgeeda, Elimunna, Newman and River land systems (GIS Database).

Van Vreeswyk et al (2004) states that the Boolgeeda and Newman land systems are not susceptible to soil erosion.

The Elimunna land system is described by Van Vreeswyk et al. (2004) as consisting of stony plains on basalt,

supporting sparse *Acacia* and *Cassia* shrublands and patchy tussock grasslands. Some drainage floors are slightly susceptible to erosion but most of the system is inherently resistant (Van Vreeswyk et al., 2004). The disturbance to any drainage lines is likely to be fairly minimal (BHP Billiton, 2010). Given this, the proposed clearing is unlikely to cause significant soil erosion within this land system.

The River land system is described by Van Vreeswyk et al. (2004) as consisting of active flood plains and major rivers supporting grassy Eucalypt woodland, tussock grasslands and soft Spinifex grasslands. Van Vreeswyk et al. (2004) reports that the system is largely stabilised by Buffel and Spinifex and accelerated erosion is uncommon, however, susceptibility to erosion is high or very high if the vegetative cover is removed. Only a very small portion of this land system occurs within the application area (GIS Database) and therefore, clearing within this land system will be minimal. Given this, the proposed clearing is unlikely to cause significant soil erosion within this land system.

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

**Methodology** BHP Billiton (2010)  
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 at variance to this Principle**

The proposed clearing is not located within any conservation areas (GIS Database). The nearest Department of Environment and Conservation managed land is Karijini National Park located approximately 110 kilometres west of the application area (GIS Database).

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

**Methodology** GIS Database  
- DEC Tenure

**(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 may be at variance to this Principle**

The application area is located within a Public Drinking Water Source Area (PDWSA) and a proclaimed surface water area under the *Rights in Water and Irrigation Act 1914* (GIS Database).

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

The Department of Water (DoW) has provided advice relating to the proposed mineral exploration in the application area.

The DoW (2010) states that clearing activities for mineral exploration are compatible with conditions in a Priority 1 PDWSA. The DoW (2010) is satisfied that the proposed clearing of 100 hectares for the purpose of exploration drilling, hydrological investigations and supporting infrastructure is unlikely to have a significant impact on the quality or quantity of groundwater.

The DoW (2010) states that any taking or diversion of surface water in a proclaimed area under the *Rights in Water and Irrigation Act 1914* for the purposes other than domestic and/or stock watering is subject to licence by the DoW. The proposed clearing area is intersected by a waterway and therefore, the proponent should use best management practices to ensure impacts to surface water as a result of the clearing are minimised (DoW, 2010).

BHP Billiton (2010) states that drilling will not occur in major drainage channels or within a 20 metre buffer from the boundary of riparian vegetation. Wherever practicable, BHP Billiton (2010) will not encroach within 10 metres of minor drainage lines that may be considered significant in relation to local and/or regional surface flow. Furthermore, BHP Billiton (2010) have developed an Exploration Environmental Management Plan that states that preference will be given for the selection of drill sites where there is a low level of vegetation and is a suitable distance from any natural drainage course. Given this, the proposed clearing is unlikely to significantly impact upon the quality of surface water within the project area.

**Methodology** BHP Billiton (2010)  
DoW (2010)  
GIS Database  
- Public Drinking Water Source Areas (PDWSAs)  
- RIWI Act, Surface Water Areas

**(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**

There are numerous ephemeral watercourses within the application area (GIS Database).

Natural flooding events occur seasonally in the Pilbara region as a result of cyclonic activity and sporadic thunderstorm activity (BHP Billiton, 2010). The ephemeral watercourses within the application area would experience natural seasonal flooding from the runoff of surface water during and following significant rainfall events (BHP Billiton, 2010). However, the proposed clearing of 100 hectares within a 517.68 hectare area for mineral exploration, is unlikely to increase the incidence or intensity of flood events.

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

**Methodology** BHP Billiton (2010)  
GIS Database  
- hydrography, linear

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

**Comments**

There is one Native Title claim (WC 99/004) over the area under application (GIS Database). This claim has been registered with the Native Title Tribunal on behalf of the claimant group. However, the tenement has 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*.

According to available databases there are numerous registered Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing 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.

The clearing permit was advertised by the Department of Mines and Petroleum on 14 June 2010, inviting submissions from the public. There were no submissions received.

**Methodology** GIS Database  
- Aboriginal Sites of Significance  
- Native Title Claims

**4. Assessor's comments**

**Comment**

This application has been assessed against the clearing principles, planning instruments and other matters in accordance with s.51O of the *Environmental Protection Act 1986*, and the proposed clearing is at variance to Principle (f), may be at variance to Principles (a), (b) and (i), is not likely to be at variance to Principles (c), (d), (g) and (j) and is not at variance to Principles (e) and (h).

**5. References**

- BHP Billiton (2010) Clearing Permit Application Supporting Documentation. BHP Billiton Iron Ore Pty Ltd.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, 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.
- DoW (2010) Clearing Permit advice. Department of Water, Western Australia.
- ENV Australia (2010) Orebody 35 Vegetation Clearing Permit Area Flora and Fauna Assessment. Unpublished report. ENV Australia Pty Ltd, Western Australia.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, 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.
- Van Vreeswyk, A.M.E., Payne, A.L., Hennig, P. and Leighton, K.A. (2004) An Inventory and Condition Survey of the Pilbara Region, Western Australia. Department of Agriculture, Western Australia.
- Western Australian Herbarium (1998-) FloraBase - The Western Australian Flora. Department of Environment and Conservation. <http://florabase.dec.wa.gov.au/>.

## 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>DMP</b>	Department of Mines and Petroleum, 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*} :-

<b>P1</b>	<b>Priority One - Poorly Known taxa:</b> 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.
<b>P2</b>	<b>Priority Two - Poorly Known taxa:</b> 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.
<b>P3</b>	<b>Priority Three - Poorly Known taxa:</b> 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.
<b>P4</b>	<b>Priority Four – Rare taxa:</b> 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.
<b>R</b>	<b>Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):</b> 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.
<b>X</b>	<b>Declared Rare Flora - Presumed Extinct taxa:</b> 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] :-

<b>Schedule 1</b>	<b>Schedule 1 – Fauna that is rare or likely to become extinct:</b> being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
<b>Schedule 2</b>	<b>Schedule 2 – Fauna that is presumed to be extinct:</b> being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
<b>Schedule 3</b>	<b>Schedule 3 – Birds protected under an international agreement:</b> 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.
<b>Schedule 4</b>	<b>Schedule 4 – Other specially protected fauna:</b> 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.