



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 3469/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: **Hamersley Iron Pty Ltd**

### 1.3. Property details

Property: Exploration Licence 47/584  
Exploration Licence 47/631  
Local Government Area: Shire of Ashburton  
Colloquial name: Juna Downs Evaluation Drilling Program

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
14.3		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 1:250,000 scale for the whole of Western Australia. Two Beard Vegetation Associations have been mapped within the application areas (GIS Database; Shepherd, 2007).

**18:** Low woodland; mulga (*Acacia aneura*); and

**567:** Hummock grasslands, shrub steppe; mulga & kanji over soft spinifex & *Triodia basedowii*.

The application area was subject to a flora and vegetation survey by a botanist from Rio Tinto between 26 and 28 June 2009 (Rio Tinto, 2009). In addition, approximately 50% of the application area has been previously surveyed by Biota Environmental Sciences in May and June 2008 (Rio Tinto, 2009). Eight vegetation types have been identified within the application area.

##### Vegetation from Flats and Plains

**S1 Mulga Flats:** *Acacia aneura*, *Corymbia deserticola* low open forest over *Eremophila lanceolata* low scattered shrubs over *Triodia melvillei* hummock grassland over *Themeda triandra*, *Chrysopogon fallax* open tussock grassland. Vegetation condition: Very good.

**S2 Clay Flats:** *Eucalyptus xerothermica* low open woodland over *Eremophila lanceolata* low open shrubland over *Themeda triandra* tussock grassland over *Aristida contorta* bunch grassland. Vegetation condition: Good.

**S3 Open Mulga Clay Plain:** *Acacia aneura* low woodland over *Eremophila lanceolata* low open shrubland over *Triodia melvillei* very open hummock grassland over *Aristida contorta* bunch grassland. Vegetation condition: Good (some grazing).

##### Vegetation from Hillslopes

**H1 Lower Slight Slope:** *Acacia aneura* high

##### Clearing Description

Hamersley Iron Pty Ltd has applied to clear up to 14.3 hectares of native vegetation within an application area of 59.1 hectares for the purpose of mineral exploration (Hamersley Iron Pty Ltd, 2009). The proposed clearing will be for drill lines and access tracks (14.05 kilometres by 4 metres), 52 drill pads (40 metres by 40 metres) and associated sumps (3 metres by 2 metres) (Hamersley Iron Pty Ltd, 2009).

Vegetation will be cleared using raised blade techniques where practicable, or scrub rake in level terrain. Where already cleared tracks require maintenance, the track may be graded using blade down clearing. The vegetation and topsoil will be collected and stockpiled for use in future rehabilitation (Hamersley Iron Pty Ltd, 2009).

##### Vegetation Condition

Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).

to

Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994).

##### Comment

Vegetation condition has been assessed and provided by a botanist from Rio Tinto.

open shrubland over *Triodia melvillei* hummock grassland. Vegetation condition: Very good.

**H2 Lower Slight Slope:** *Acacia aneura* high shrubland over *Eremophila longifolia*, *Acacia steedmanii* open shrubland over *Sida fibulifera* low open shrubland over *Triodia melvillei* very open hummock grassland over *Paraneurachne muelleri*, *Aristida latifolia*, *Eulalia aurea* tussock grassland. Vegetation condition: Good.

**H3 Slight Stony Slope:** *Corymbia deserticola*, *Eucalyptus gamophylla*, *Codonocarpus cotinifolius* low open forest over *Acacia steedmanii* shrubland over *Halgania gustafsenii*, *Solanum turtianum* low open shrubland over *Triodia wiseana*, *T. basedowii* hummock grassland over *Themeda triandra*, *Cymbopogon ambiguus*, *Amphipogon caricinus* very open tussock grassland. Vegetation condition: Very good.

**H4 Slight Stony Slope:** *Corymbia deserticola* low woodland over *Acacia steedmanii* shrubland over *Halgania gustafsenii*, *Scaevola parvifolia pilbarae* low shrubland over *Triodia pungens* open hummock grassland over *Aristida latifolia*, *Eragrostis setifolia*, *Amphipogon caricinus* tussock grassland. Vegetation condition: Good.

#### Vegetation from Minor Drainage Lines

**D1 Slight Slope, Shallow Drainage:** *Corymbia deserticola* low woodland over *Sida spiciform panicles*, *Eremophila longifolia* open heath over *Hibiscus sturtii*, *Sida platycalyx*, *Indigofera georgei* low shrubland over *Triodia pungens* very open hummock grassland over *Themeda triandra*, *Aristida latifolia*, *Chrysopogon fallax* tussock grassland. Vegetation condition: Good.

### 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 is not likely to be at variance to this Principle**

The application area is located within the Hamersley subregion of the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion which encompasses an area of 17,804,188 hectares (GIS Database; Shepherd, 2007). The Hamersley subregion is characterised by sedimentary ranges and plateaux, dissected gorges, low Mulga woodlands over bunch grasses in valley floors and *Eucalyptus* woodlands over *Triodia* spp. on skeletal soils of the ranges (Kendrick, 2001). The vegetation within the application area has been mapped as Beard Vegetation Associations 18 and 567 which are well represented throughout the bioregion with approximately 100% of the pre-European extent remaining (GIS Database; Shepherd, 2007).

A flora and vegetation survey of the application area was undertaken by a botanist from Rio Tinto in June 2009. This survey identified a total of eight vegetation communities and the vegetation condition ranged from 'Very good' to 'Good' (Rio Tinto, 2009). All of the vegetation communities are considered to be well represented and widely distributed throughout the Hamersley subregion, and also within Karijini National Park.

The survey recorded a total of 147 native flora species from 70 genera and belonging to 33 families within the application area (Rio Tinto, 2009). No Declared Rare Flora or Threatened Ecological Communities were recorded within the application area. One Priority Flora species, *Rhagodia* sp. Hamersley (M. Trudgen 17794) (Priority 3), was recorded at five locations within the application area. This species is not uncommon in snakewood (*Acacia xiphophylla*) and mulga (*Acacia aneura*) vegetation, and as a result the proposed clearing is not likely to impact on the conservation significance of this species (Rio Tinto, 2009).

Rio Tinto (2009) comment that the number of species recorded within the application area appears to be low for a survey area of this size, and indicates that this is most likely due to the low diversity of landforms and vegetation communities, the dry conditions at the time of the survey and the affects of a recent fire. The vegetation within the application area is not likely to represent a higher level of floristic diversity than surrounding areas.

Three weed species were recorded within the application area; Spiked Malvastrum (*Malvastrum americanum*), Bipinnate Beggartick (*Bidens bipinnata*) and Flaxleaf Fleabone (*Conyza bonariensis*). The presence of these introduced weed species lowers the biodiversity value of the area proposed to be cleared. Should a permit be granted, it is recommended that a condition be imposed for the purpose of weed management.

A search of the Department of Environment and Conservation's (DEC's) Nature Map database identified 5 Amphibian, 39 Avian, 23 Mammalian and 76 Reptilian species that may occur within the application area (Department of Environment and Conservation, 2009). These results indicate that the application area may provide suitable habitat for a high diversity of reptile and avian species. Three broad terrestrial fauna habitats were identified within the application area (Rio Tinto, 2009). These habitat types are both common and widespread in the Hamersley subregion and also within Karijini National Park, and are not considered to be under threat by the proposed exploration works. The application is not likely to represent a higher level of faunal diversity than surrounding areas.

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

**Methodology** Department of Environment and Conservation (2009)  
Kendrick (2001)  
Rio Tinto (2009)  
Shepherd (2007)  
GIS Database:  
- IBRA Australia  
- Pre-European Vegetation

**(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 is not likely to be at variance to this Principle**

A search of the Department of Environment and Conservation's (DEC's) Nature Map database was undertaken by the assessing officer using the coordinates 22°47'59"S and 118°25'39"E, thereby representing a 40 kilometre radius from the central part of the application area. This search identified 5 Amphibian, 39 Avian, 23 Mammalian and 76 Reptilian species that may occur within the application area (Department of Environment and Conservation, 2007). These results indicate that the application area may provide suitable habitat for a high diversity of reptile and avian species.

Hamersley Iron Pty Ltd carried out a search of the DEC's Threatened and Priority Fauna Database between the coordinates 22.4975°S 118.1108°E and 23.2221°S 118.9519°E. Based on the Nature Map database search and the DEC Threatened and Priority Fauna Database search the following conservation significant species have been recorded within the search area:

- Northern Quoll (*Dasyurus hallucatus*) - Schedule 1 (Fauna that is rare or is likely to become extinct) of the Wildlife Conservation (Specially Protected Fauna) Notice 2008; Endangered (*Environment Protection and Biodiversity Conservation Act 1999*);
- Lakeland Downs Mouse (*Leggadina lakedownensis*) - DEC Priority Four;
- Western Pebble-mound Mouse (*Pseudomys chapmani*) - DEC Priority Four;
- Ghost Bat (*Macroderma gigas*) - DEC Priority Four;
- Pilbara Olive Python (*Liasis olivaceus barroni*) - Schedule 1 (Fauna that is rare or is likely to become extinct) of the Wildlife Conservation (Specially Protected Fauna) Notice 2008(2); Vulnerable (*Environment Protection and Biodiversity Conservation Act 1999*);
- Australian Bustard (*Ardeotis australis*) - DEC Priority Four; and
- Grey Falcon (*Falco hypoleucos*) - DEC Priority Four.

Fauna habitat descriptions have been provided for the application area based on the dominant landforms and vegetation types occurring within the study area. Three broad terrestrial fauna habitats have been described for the application area. These are:

- Minor drainage lines supporting *Corymbia* low woodland over mixed open heath over mixed low shrubland over *Triodia* very open hummock grassland over mixed tussock grassland;
- Hillslopes of *Corymbia* low woodland over *Acacia* shrubland over mixed low open shrubland over *Triodia* hummock grassland over mixed very open tussock grassland; and
- Flats & plains supporting *Acacia*, *Corymbia* or *Eucalyptus* low open woodland over *Eremophila* low open shrubland over *Triodia* hummock grassland over mixed bunch grassland.

These habitat types are both common and widespread in the Pilbara bioregion and would not be considered to be under threat by the proposed exploration works. No significant fauna habitats such as major caves, rock piles, waterholes, termite mounds or sandy banks were observed within the application area during the vegetation assessment (Rio Tinto, 2009). It is likely that equal or higher quality vegetation and fauna habitats would exist throughout the surrounding area, and Pilbara bioregion which remains largely uncleared.

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

**Methodology** Department of Environment and Conservation (2009)  
Rio Tinto (2009)

**(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**

According to available datasets there are no known records of Declared Rare Flora (DRF) or Priority Flora species within the application area (GIS database). There are two records of the DRF species *Thryptomene wittweri* within 15 kilometres of the application area, and one record for the DRF species *Lepidium catapycnon* within 35 kilometres of the application area (GIS Database).

The entire application area was subject to a flora and vegetation survey by a botanist from Rio Tinto between 26 and 28 June 2009 (Rio Tinto, 2009). No DRF species were recorded within the application area (Rio Tinto, 2009). The application area does not contain suitable habitat for *Thryptomene wittweri*, whilst it does somewhat for *Lepidium catapycnon* (Rio Tinto, 2009). *Lepidium catapycnon* has never been recorded from the vicinity of the application area, and with the species perennial growth form and distinctive zig zag stem it is unlikely it would have been missed (Rio Tinto, 2009).

The following Priority Flora species have been recorded within 20 kilometres of the application area: *Goodenia lyrata* (Priority 1), *Goodenia* sp. East Pilbara (A. A. Mitchell PRP 727) (Priority 1), *Pilbara trudgenii* (Priority 2), *Acacia effusa* (Priority 2), *Eremophila magnifica* subsp. *velutina* (Priority 3), *Dampiera metallorum* (Priority 3), *Indigofera gilesii* subsp. *gilesii* (Priority 3), *Acacia bromilowiana* (Priority 3), *Acacia daweara* (Priority 3).

One Priority Flora species, *Rhagodia* sp. Hamersley (M. Trudgen 17794) (Priority 3), was recorded within the application area. This species was recorded at five locations within the application area (Rio Tinto, 2009). This species is not uncommon in snakewood (*Acacia xiphophylla*) and mulga (*Acacia aneura*) vegetation in the Hamersley subregion. The proposed clearing is not likely to impact on the conservation significance of this species.

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

**Methodology** Rio Tinto (2009)  
GIS Database:  
- Declared Rare and Priority Flora List

**(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 records of Threatened Ecological Communities (TEC's) within the application area (GIS database). The nearest known TEC's is located approximately 25 kilometres south-east of the application area (GIS database). The botanist from Rio Tinto has confirmed that none of the vegetation communities recorded within the application areas represent a TEC or Priority Ecological Community (Rio Tinto, 2009).

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

**Methodology** Rio Tinto (2009)  
GIS Database:  
- Threatened Ecological Sites\_1  
- Threatened Ecological Boundaries

**(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 clearing application area falls within the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) region in which approximately 99.9% of the pre-European vegetation remains (see table) (GIS database; Shepherd, 2007).

The vegetation of the clearing application area has been mapped as Beard vegetation association 18: Low woodland; mulga (*Acacia aneura*) and 567: Hummock grasslands, shrub steppe; mulga & kanji over soft spinifex & *Triodia basedowii* (GIS Database). According to Shepherd (2007) approximately 100% of Beard vegetation associations 18 and 567 remains at both the state and bioregional level (see table).

According to the Bioregional Conservation Status of Ecological Vegetation Classes, the conservation status for the Pilbara Bioregion and Beard vegetation association 18 and 567 is of "Least Concern" (Department of Natural Resources and Environment, 2002) (see table).

While a small to moderate percentage of the vegetation types within the Pilbara bioregion are protected within conservation reserves, the bioregion remains largely uncleared. As a result, the conservation of the vegetation associations within the bioregion is not likely to be impacted on by this proposal.

	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 veg assoc. – State					
18	19,892,305	19,890,195	~100	Least Concern	2.1
567	777,507	777,507	~100	Least Concern	22.3
Beard veg assoc. – Bioregion					
18	676,557	676,557	~100	Least Concern	10.2
567	776,824	776,826	~100	Least Concern	16.8

\* Shepherd (2007)

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

The vegetation under application is not a remnant of vegetation in an area that has been extensively cleared.

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 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 not likely to be at variance to this Principle**

There are no permanent wetlands or watercourses within the application area (GIS Database; Hamersley Iron Pty Ltd, 2009). Whilst there are numerous minor, non-perennial watercourses within the application area, the vegetation communities growing in association with these watercourses are not unique and are considered common and widespread in the Pilbara bioregion (Shepherd, 2007; GIS Database).

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

**Methodology** Hamersley Iron Pty Ltd (2009)  
Shepherd (2007)  
GIS Database:  
- Hydrography, linear\_1

**(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**

According to the available datasets the application area comprises of the Boolgeeda and Wannamunna Land Systems (GIS Database).

The Boolgeeda Land System is characterised by stony lower slopes and plains below large range hill systems that support spinifex grasslands and Mulga shrublands (Van Vreeswyk et al., 2004). The application area is likely to comprise of the 'stony lower plains' landform unit which is described as typically supporting hummock grasslands of hard spinifex (*Triodia wiseana* or *T. lanigera*) or soft spinifex (*T. pungens*), often with moderately closed tall shrublands or *Acacia aneura* and other acacias (Van Vreeswyk et al., 2004). Van Vreeswyk et al. (2004) report that the Boolgeeda Land System is not susceptible to erosion.

The Wannamunna Land System is characterised by hardpan plains and internal drainage tracts supporting mulga shrublands and woodlands (and occasionally eucalypt woodlands) (Van Vreeswyk et al., 2004). The application area is likely to contain two landform units of the Wannamunna Land System based on the assessment of vegetation types and land system information; 'hardpan plains and 'internal drainage plains'. The soil types within the 'hardpan plains' landform unit comprises of red-brown hardpan shallow loams and some red shallow loams, whilst soil types within the 'internal drainage plains' landform unit comprises of red deep/brown cracking clays and red loamy earths (Van Vreeswyk et al., 2004). Van Vreeswyk et al., (2004) report that the Wannamunna Land System generally has low susceptibility to erosion. Use of heavy machinery

on the vegetation type 'S2 Clay Flats' may cause soil compaction or promote erosion which may restrict vegetation growth once exploration activities have been completed. Should a permit be granted, it is recommended that a condition be imposed for the purpose of rehabilitation.

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

**Methodology** 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**

According to available datasets the application area is not located within a Department of Environment and Conservation (DEC) managed conservation area (GIS Database). Karijini National Park is situated approximately 400 metres west, north-west of the application area at its closest point (GIS Database). Aerial imagery demonstrates that there are large amounts of intact vegetation adjoining Karijini National Park, and with the Pilbara bioregion largely uncleared with approximately 99.9% of pre-European vegetation remaining the vegetation under application is not considered an important ecological linkage to other conservation areas or reserves.

The proposed clearing is not likely to comprise the environmental values of Karijini National Park.

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

**Methodology** GIS Database:  
- DEC Tenure  
- Munjina 50cm Orthomosaic

**(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**

There are no permanent wetlands or watercourses within or adjacent to the application area (GIS Database). The proposed clearing is unlikely to cause deterioration in the quality of surface water in the local area.

The application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is Millstream Water Reserve which is located approximately 97 kilometres north-west of the application area (GIS Database). Given the distance separating the application area and the nearest water supply area, the proposed clearing is unlikely to impact on the water quality of the Millstream Water Reserve.

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

**Methodology** GIS Database:  
- Hydrography, linear\_1  
- Public Drinking Water Source Areas (PDWSAs)

**(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**

The application area is located within the Ashburton River Catchment Area which covers a total area of approximately 7,877,743 hectares (GIS Database). The proposed clearing of native vegetation for exploration purposes is not likely to impact on the drainage characteristics of the Ashburton River Catchment, or the local area.

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

**Methodology** GIS Database:  
- Hydrographic Catchments - Catchments

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

**Comments**

There is one Native Title Claim over the area under application (WC96/061). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the 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 no registered Sites of Aboriginal Significance within the area applied to clear (GIS Database). 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. Hamersley Iron Pty Ltd (2009) has advised that heritage surveys will be undertaken and that any sites identified will be avoided.

One direct interest submission was received during the public submissions period stating no objection to the proposal.

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** Hamersley Iron Pty Ltd (2009)  
GIS Database  
- Native Title Claims  
- Sites of Aboriginal Significance DIA

#### 4. Assessor's comments

##### Comment

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

It is recommended that should a permit be granted, conditions be imposed on the permit for the purpose of weed management, record keeping and permit reporting.

Hamersley Iron Pty has applied to clear up to 14.3 hectares of native vegetation within an application area totalling 59.1 hectares for the purpose of mineral exploration (RC drilling). The applicant detailed in their application that each drill pad would be 40 metres by 40 metres in size. The assessing officer sought clarification from the Minerals Environment Branch at the Department of Mines and Petroleum regarding the appropriate drill pad size for RC drilling, and was advised that the industry standard for drill pad sizes for RC drilling may range from 15 metres by 10 metres to 15 metres by 20 metres. The applicant was contacted and requested to clarify the size of their drill pads, and revise whether their drill pad size could be reduced given the standard drill pad sizes for RC drilling. The applicant confirmed during the assessment of the application that a drill pad size of 25 metres by 20 metres would be acceptable for these proposed exploration activities. Given the reduction in the size of each drill pad, it is recommended that a maximum area of 8.4 hectares be authorised.

#### 5. References

- Department of Environment and Conservation (2009). NatureMap: Mapping Western Australia's Biodiversity. Department of Environment and Conservation. Viewed 22 December 2009. <<http://naturemap.dec.wa.gov.au/>>.
- 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.
- Hamersley Iron Pty Ltd (2009). Documentation Accompanying Clearing Permit Application for CPS 3469/1, Prepared by Hamersley Iron Pty Ltd, November 2009.
- 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 (2001). A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Pilbara 3 (PIL3 - Hamersley subregion) Department of Conservation and Land management, Western Australia.
- Rio Tinto (2009). Botanical Survey for an Evaluation Drilling Program at Juna Downs & Supporting Document to a Native Vegetation Clearing Permit Application, prepared by Rio Tinto Iron Ore Pty Ltd, September 2009.
- 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.E., Payne A.L., Leighton K.A. and Hennig P. (2004). Technical Bulletin - An inventory and condition survey of rangelands in Pilbara Region, Western Australia, No 92, Department of Agriculture, Government of Western Australia, Perth, Western Australia.

#### 6. Glossary

##### Acronyms:

**BoM** Bureau of Meteorology, Australian Government.  
**CALM** Department of Conservation and Land Management, Western Australia.  
**DAFWA** Department of Agriculture and Food, Western Australia.  
**DA** 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* } :-

- 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.