



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 4780/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: Hamersley Iron Pty Ltd

### 1.3. Property details

Property: Iron Ore (Hamersley Range) Agreement Act 1963, Mineral Lease 4SA (AML 70/4)  
Local Government Authority: Shire of Ashburton  
Colloquial name: Western Turner Syncline B1 Project

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
202		Mechanical Removal	Construction camp, communications tower, geotechnical investigations, exploration drilling, access road, pipeline and associated activities.

### 1.5. Decision on application

Decision on Permit Application: Grant  
Decision Date: 9 February 2012

## 2. Background

### 2.1. Existing environment and information

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

**Vegetation Description** Beard vegetation associations have been mapped for the whole of Western Australia and are useful to look at vegetation in a regional context. The following Beard vegetation associations have been mapped within the application area (GIS Database):

82: Hummock grasslands, low tree steppe; snappygum over *Triodia wiseana*; and

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

A flora and vegetation survey was conducted over the Western Turner Syncline Section 10 area by botanists from Biota Environmental Sciences (Biota) in 2007. A survey incorporating additional areas to the 2007 survey was conducted in April 2011. These surveys cover the eastern portion of the application area.

A review conducted by Biota (2011a) of a number of different flora surveys provides information on the vegetation within the western portion of the application. The following 28 vegetation units were recorded within the application area (Biota 2007; 2011a; 2011b):

1. **AprAciAanTw:** *Acacia pruinocarpa*, *A. citrinoviridis*, *A. aff. aneura* tall shrubland over *Triodia wiseana* hummock grassland;
2. **AxAanTwTe:** *Acacia xiphophylla*, *A. aneura* low open woodland to low open forest over *Triodia wiseana*, *T. epactia* hummock grassland;
3. **EIAhAmTw:** *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia hamersleyensis*, *A. maitlandii* tall open scrub over *Triodia wiseana* hummock grassland;
4. **EIAkTaffe:** *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Acacia kempeana* open shrubland over *Triodia aff. epactia* (small lemma form; WTS50-03) hummock grassland;
5. **EIAmTbrTw:** *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Acacia maitlandii* tall open scrub over *Triodia brizoides*, *T. wiseana* hummock grassland;
6. **AanAprAbERfTwTe:** *Acacia aff. aneura* (narrow fine veined; site 1259), *A. aneura* (grey bushy form, MET 15,732), *A. pruinocarpa* tall shrubland over *Acacia bivenosa*, *Eremophila forrestii* open shrubland over *Maireana georgei*, *Tribulus suberosus* scattered low shrubs over *Triodia wiseana*, *T. epactia* hummock grassland;
7. **AxAanT spp:** *Acacia xiphophylla*, *A. "aneura"* tall shrubland over *Triodia* spp. very open hummock Grassland;
8. **ChTw:** *Corymbia hamersleyana* scattered low trees over *Triodia wiseana* hummock grassland; and
9. **EIEgAprAaAatTw:** *Eucalyptus leucophloia*, *E. gamophylla* scattered low trees over *Acacia pruinocarpa* scattered tall shrubs over *A. ancistrocarpa*, *A. atkinsiana* scattered shrubs over *Triodia wiseana* open hummock

grassland.

10. **AanAprTbr:** *Acacia* aff. *aneura* (narrow fine veined; site 1259), *A. pruinocarpa* tall open shrubland over *Triodia brizoides* hummock grassland;
11. **AprTw:** *Acacia pruinocarpa* tall open shrubland over *Triodia wiseana* hummock grassland;
12. **EIAhAmTbrTw:** *Eucalyptus leucophloia* scattered low trees over *Acacia hamersleyensis*, (*A. maitlandii*) tall open shrubland over *Triodia brizoides*, *T. wiseana* open hummock grassland;
13. **EIAhTwTe:** *Eucalyptus leucophloia* scattered low trees over *Acacia hamersleyensis* tall open shrubland over *Triodia wiseana*, *T. epactia* open hummock grassland;
14. **EIAmTbr:** *Eucalyptus leucophloia* scattered low trees over *Acacia maitlandii* shrubland over *Triodia brizoides* open hummock grassland;
15. **EIAmTwTe:** *Eucalyptus leucophloia* scattered low trees over *Acacia maitlandii* shrubland over *Triodia wiseana* (*T. epactia*) open hummock grassland;
16. **EIEgAprAaAatAexTeTw:** *Eucalyptus leucophloia*, *E. gamophylla* low open woodland over *Acacia pruinocarpa*, *A. ancistrocarpa*, *A. atkinsiana*, *A. exilis* tall open shrubland over *Triodia epactia*, *T. wiseana* hummock grassland; and
17. **EITbr:** *Eucalyptus leucophloia* scattered low trees over *Triodia brizoides* hummock grassland.
18. **AmoAciAmTeTHt:** *Acacia monticola*, *A. citrinoviridis* tall shrubland over *Acacia maitlandii* open heath over *Triodia epactia* hummock grassland and *Themeda triandra* tussock grassland;
19. **EIAanTe:** *Eucalyptus leucophloia* low open woodland over *Acacia "aneura"* tall shrubland over *Triodia epactia* hummock grassland; and
20. **EIAhAprAmTbrTeERIm:** *Eucalyptus leucophloia* low open woodland over *Acacia hamersleyensis*, *A. pruinocarpa* tall open shrubland over *Acacia maitlandii* open shrubland over *Triodia brizoides*, *T. epactia* open hummock grassland with *Eriachne mucronata* very open tussock grassland.
21. **AciTaffe:** *Acacia citrinoviridis* low open woodland to low open forest over *Triodia* aff. *epactia* (small lemma form; WTS50-03) hummock grassland;
22. **AxAanT spp:** *Acacia xiphophylla*, *A. aneura* low open woodland to low open forest over *Triodia* species hummock grassland
23. **EIAarAatAbAmGbTw:** *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees to low open woodland over combinations of *Acacia arida*, *A. atkinsiana*, *A. bivenosa*, *A. maitlandii*, *Grevillea berryana* open shrubland to open heath over *Triodia wiseana* hummock to closed hummock grassland;
24. **EIAciAprTe:** *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia citrinoviridis*, *A. pruinocarpa* tall open scrub over *Triodia epactia* hummock grassland with *Themeda triandra*, *Digitaria brownii* open tussock grassland;
25. **EIAciGO rTe:** *Eucalyptus leucophloia* scattered low trees over *Acacia citrinoviridis*, *Gossypium robinsonii* tall shrubland over *Triodia epactia* open hummock grassland;
26. **EIChAatTeTw:** *Eucalyptus leucophloia*, *Corymbia hamersleyana* low open woodland over *Acacia atkinsiana* tall open scrub over *Triodia epactia*, *T. wiseana* open hummock grassland;
27. **EITe:** *Eucalyptus leucophloia* scattered low trees over *Triodia epactia* hummock grassland; and
28. **TOC:** Third order creeklines.

**Clearing Description**

Hamersley Iron Pty Ltd has applied to clear 202 hectares within an application area of approximately 1215 hectares (GIS Database). The application area is located approximately 20 kilometres west of Tom Price (GIS Database).

The proposed clearing is required for a construction camp, communications tower, geotechnical investigations, exploration drilling, an access road, pipeline and associated activities.

**Vegetation Condition**

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

to

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

**Comment**

The vegetation condition was assessed by botanists from Biota.



### 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 occurs within the Hamersley (PIL3) subregion of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). This subregion is characterised by Mulga low woodlands over bunch grasses on fine textured soils in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (CALM, 2002). The vegetation within the application area consists of Beard vegetation associations 82 and 567, which are common and widespread throughout the Pilbara bioregion with approximately 100% of the pre-European vegetation extent remaining (Shepherd, 2009; GIS Database).

Flora and vegetation surveys including the application area identified 28 vegetation communities within the application area (Biota 2007; 2011a; 2011b). None of these communities have been identified as a Threatened or Priority Ecological Community and there are no records of either within the application area (Biota, 2011a; GIS Database).

A review of flora surveys for a study area which includes the majority of the application area by Biota (2011a) identified a total of 164 taxa comprising 82 genera from 37 families. Broader surveys over the Western Turner Syncline project area which also incorporated an infrastructure corridor to Tom Price (20 kilometres east) identified 218 native flora species (Biota, 2011b) and 273 native flora species (Biota, 2007). The dominant plant families and genera identified are commonly found to dominate vegetation in the Pilbara (Biota, 2011a).

Biota (2011a) identified six weed species within the application area, none of which are listed as Declared Plants under the *Agriculture and Related Resources Protection Act 1976*. Potential impacts from weed species may be minimised by the implementation of a weed management condition.

A review of DEC databases by Biota (2011a) identified potential for one Declared Rare Flora (DRF) species, seven Priority 3 species and one Priority 4 species to occur within the application area. The closest record of the DRF species *Lepidium catapycnon* is located 24 kilometres southeast of the application area and the species was not located during foot traverses through representative habitats of the application area (Biota, 2011a). Only one Priority flora species was located within the application area (*Indigofera* sp Bungaroo creek - Priority 3), however 153 individuals of this species have been recorded from an additional 30 locations outside the application area during surveys of the broader Western Turner Syncline project area (Biota, 2011a). Suitable habitat is not considered to be present within the application area for the remaining Priority flora species none of which were identified during foot traverses of the application area (Biota, 2011a).

Biota (2011a) identified three broad terrestrial fauna habitat types which occur within the Western half of the application area. Biota (2011b) identified six broad habitat types within areas which include the eastern half of the application area. The fauna habitats found are common and widespread throughout the Hamersley subregion (Biota, 2011a, Biota 2011b). The faunal assemblages of the Western Turner Syncline locality have been the subject of extensive and systematic survey work by Biota (2009a) and Biota (2009b). These fauna surveys recorded a total of 126 and 96 fauna species respectively (Biota, 2011b). The fauna species recorded during these surveys were generally representative of the taxa commonly recorded in this part of the bioregion (Biota, 2011b). None of the fauna habitats present are considered to be locally or regionally restricted (Biota, 2011b).

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

**Methodology**      Biota (2007)  
Biota (2009a)  
Biota (2009b)  
Biota (2011a)  
Biota (2011b)  
Shepherd (2009)  
CALM (2002)  
GIS Database:  
- Threatened Ecological Sites Buffered

#### (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**

Biota (2011a) identified three broad terrestrial fauna habitat types which occur within the Western half of the application area:

1. Open shrublands of mixed Acacia species over mixed *Triodia* hummock grasslands on stony plains and lower slopes;
2. Scattered low trees of *Eucalyptus leucophloia* over mixed Acacia shrublands over *Triodia* hummock grasslands on slopes and crests of rocky hills and ridges; and
3. Open shrublands to tall open scrubs of mixed Acacia species over *Triodia* hummock grasslands in creeklines and adjoining alluvial flats.



Biota (2011b) identified six broad habitat types within areas which include the eastern half of the application area:

1. Open *Triodia* hummock grassland with emergent Eucalyptus on stony hills and rocky slopes;
2. Breakaways on hilltops with very open *Triodia* hummock grasslands and scattered *Acacia* spp. shrubs;
3. *Eucalyptus leucophloia* woodland over *Acacia citrinoviridis* on minor drainages;
4. Dense *Acacia* shrublands with emergent Eucalyptus on incised minor drainage lines;
5. Open mulga *Acacia aneura* woodland over open *Triodia* hummock grassland on stony clay plains; and
6. Open *Triodia* hummock grassland with scattered *Acacia* spp. on stony calcrete plain.

The fauna habitats found are common and widespread throughout the Hamersley subregion (Biota, 2011a, Biota 2011b).

The faunal assemblages of the Western Turner Syncline locality have been the subject of extensive and systematic survey work by Biota (2009a) and Biota (2009b). These fauna surveys recorded a total of 126 and 96 fauna species respectively (Biota, 2011b). The fauna species recorded during these surveys were generally representative of the taxa commonly recorded in this part of the bioregion (Biota, 2011b). None of the fauna habitats present are considered to be locally or regionally restricted (Biota, 2011b).

Biota (2011a) identified eighteen conservation significant species that have potential to occur within the application area (Biota, 2011a):

1. Northern Quoll (*Dasyurus hallucatus*) – Schedule 1; Endangered;
2. Pilbara Orange Leaf-nosed Bat (*Rhinionictis aurantius*) – Schedule 1; Vulnerable;
3. Pilbara Olive Python (*Liasis olivaceus barroni*) – Schedule 1; Vulnerable;
4. Blind Snake (*Ramphotyphlops ganei*) – Priority 1;
5. Ghost Bat (*Macroderma gigas*) – Priority 4;
6. Star Finch (*Neochmia ruficauda subclarescens*) – Priority 4
7. Western Pebble-mound Mouse (*Pseudomys chapmani*) – Priority 4;
8. Australian Bustard (*Ardeotis australis*) – Priority 4;
9. Long-tailed Dunnart (*Sminthopsis longicaudata*) – Priority 4;
10. Grey Falcon (*Falco hypoleucos*) – Priority 4;
11. Bush Stone-curlew (*Burhinus grallarius*) – Priority 4;
12. Short-tailed Mouse (*Leggadina lakedownensis*)
13. Peregrine Falcon (*Falco peregrinus*) – Schedule 4;
14. Rainbow Bee-eater (*Merops ornatus*) – Migratory.
15. Fork-tailed Swift (*Apus pacificus*) – Schedule 3; Migratory;
16. Great Egret (*Ardea modesta*) – Schedule 3; Migratory;
17. Cattle Egret (*Ardea ibis*) – Schedule 3; Migratory; and
18. Common Sandpiper (*Actitis hypoleucos*) – Schedule 3; Migratory.

Only the Australian Bustard was recorded within the application area during a survey undertaken by Biota (2009b), however this species is highly mobile and the application area is not likely to provide significant habitat for this species. Whilst the Northern Quoll, Pilbara Orange Leaf-nosed Bat, Pilbara Olive Python and Ghost Bat may utilise the habitat provided by the application area, the area proposed for clearing does not contain core habitat for these species such as caves, gorges, gullies or rocky pools (Biota, 2011a).

The Western Pebble-mound Mouse has been recorded in the vicinity of the application area and the Bush Stone Curlew has potential to utilise habitat within the application area. However, the habitat available for these Priority 4 species is common and widespread within the Pilbara Bioregion and the proposed clearing is not likely to impact the conservation status of these species (Biota, 2011a).

Biota (2011a) have identified that the proposed clearing is not expected to have a significant impact on the conservation status of the remaining species as there is unlikely to be suitable habitat available within the application area.

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

Methodology Biota (2007)  
Biota (2009a)  
Biota (2009b)  
Biota (2011a)  
Biota (2011b)

**(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**

There are no records of Declared Rare Flora (DRF) within the application area (GIS Database). Flora surveys over the application area undertaken by Biota in 2007 and 2011 identified suitable habitat for the DRF species *Lepidium catapycnon* (Biota, 2011a) however this species was not recorded during foot traverses through

representative habitats in the application area.

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

**Methodology** Biota (2011a)  
GIS Database:  
- Threatened 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**  
According to available databases, there are no records of any Threatened Ecological Communities (TECs) within the application area (GIS Database). Vegetation surveys undertaken over the application area by Biota in 2007 and 2011 did not identify any TECs (Biota, 2011a).

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

**Methodology** Biota (2011a)  
GIS Database:  
- Threatened Ecological Sites Buffered

**(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 Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 99.9% of the pre-European vegetation remains (see table) (GIS Database, Shepherd, 2009).

The vegetation of the application area has been mapped as the following Beard vegetation associations (GIS Database):

82: Hummock grasslands, low tree steppe; snappygum over *Triodia wiseana*; and  
567: Hummock grasslands, shrub steppe; mulga and kanji over soft spinifex & *Triodia basedowii*.

According to Shepherd (2009) approximately 100% of these Beard vegetation associations remains at both a state and bioregional level. Therefore the area proposed to be cleared does not represent a significant 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	17,804,193	17,785,000	~99.9	Least Concern	6.3
<b>Beard veg assoc. – State</b>					
82	2,565,901	2,565,901	~100	Least Concern	10.2
567	777,507	777,507	~100	Least Concern	22.3
<b>Beard veg assoc. – Bioregion</b>					
82	2,563,583	2,563,583	~100	Least Concern	10.2
567	776,824	776,824	~100	Least Concern	22.4

\* Shepherd (2009)

\*\* 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 (2009)  
GIS Database:  
- IBRA WA (Regions - Sub Regions)  
- 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**

A major river which flows into the Hardey River is located 1.5 kilometres east of the application area. There are also numerous ephemeral watercourses recorded within the application area (GIS Database). Several vegetation units have been identified within the application area which are associated with drainage lines (Biota, 2011a), however, these vegetation types are common and widespread throughout the local area.

Given that some of the vegetation proposed for clearing has been identified within drainage lines the native vegetation to be cleared is considered to be growing in association with a watercourse. However, the clearing of vegetation associated with minor drainage lines is not expected to have significant impacts on watercourses in the Western Turner area.

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

**Methodology** Biota (2011a)  
GIS Database:  
- Hydrography, linear  
- Rivers

**(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 on the Newman and Platform land systems (GIS Database).

The Newman land system consists of rugged jaspilite plateaux, ridges and mountains supporting Hard Spinifex grasslands. The Platform land system consists of dissected slopes and raised plains supporting Hard Spinifex grasslands. These land systems are generally not prone to erosion (Van Vreeswyk et al., 2004).

The average annual evaporation rate is over eight times the annual average rainfall so there is a low probability of the proposed clearing causing increased groundwater recharge resulting in rising saline water tables (GIS Database).

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

**Methodology** Van Vreeswyk et al. (2004)  
GIS Database:  
- Evaporation isopleths  
- Rainfall, mean Annual  
- 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**

The application area does not lie within any conservation areas or DEC managed lands (GIS Database). The nearest conservation area is Karijini National Park which is located approximately 32 kilometres east of the application area (GIS Database). Given the distance between the application area and the National Park, the proposed clearing is not likely to impact the environmental values of any conservation areas.

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

The application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database).

There are several minor non-perennial watercourses within the application area (GIS Database), however, the average annual evaporation rate is over eight times the annual average rainfall and any surface water within the application area is only likely to occur as sheet flow following heavy rains (GIS Database).

The groundwater within the application area is between 500 – 1,000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database). This is considered to be potable water and it would not be expected that the



proposed clearing would cause salinity levels within the application or surrounding area to alter.

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

**Methodology** GIS Database:  
- Evaporation Isopleths  
- Groundwater Salinity, Statewide  
- Hydrography, linear  
- Mean Average Rainfall  
- 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**  
With an average annual rainfall of 400 millimetres and an average annual evaporation rate of 3,400 millimetres there is likely to be little surface flow during normal seasonal rains (GIS Database). Whilst large rainfall events may result in some flooding, the proposed clearing is not likely to lead to an increase in the incidence or intensity of flooding.

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

**Methodology** GIS Database:  
- Evaporation Isopleths  
- Mean Average Rainfall

**Planning instrument, Native Title, RIWI Act Licence, EP Act Licence, Works Approval, Previous EPA decision or other matter.**

**Comments**  
There is one native title claim over the area under application (GIS Database). This claim (WC97/89) was determined by the Federal Court on 1 March 2007 (GIS Database). However, the mining tenure 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 three registered Aboriginal Site 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 application was advertised on 2 January 2012 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received.

**Methodology** GIS Database:  
- Aboriginal Sites of Significance  
- Native Title claims - Determined by the Federal Court

#### 4. References

- Biota (2007) A Vegetation and Flora Survey of the West Turner Section 10 Area and Infrastructure Corridor. Unpublished report for Pilbara Iron, dated December 2007.
- Biota (2009a) A Two Phase Fauna Survey of the West Turner Syncline Area. Prepared for Pilbara Iron Company May 2009.
- Biota (2009b) West Turner Syncline Section 10 Development Two Phase Fauna Survey. Prepared for Pilbara Iron Company March 2009
- Biota (2011a) West Turner Syncline B1 Deposit Access Corridor and Preliminary Works: Native Vegetation Clearing Permit Report
- Biota (2011b) Western Turner Syncline Section 10 Expanded Vegetation and Flora Survey Report. Unpublished report for Rio Tinto Pty Ltd, dated July 2011.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Pilbara 3 (PIL3 - Hamersley subregion) 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.
- 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. (2009) 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.

## 5. 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.
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
DoE	Department of Environment, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
DoW	Department of Water
EP Act	Environment Protection Act 1986, Western Australia.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System.
IBRA	Interim Biogeographic Regionalisation for Australia.
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI	Rights in Water and Irrigation Act 1914, Western Australia.
s.17	Section 17 of the Environment Protection Act 1986, Western Australia.
TECs	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	<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.
P2	<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.
P3	<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.
P4	<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.
R	<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.
X	<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] :-

Schedule 1	<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.
Schedule 2	<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.
Schedule 3	<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.



**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.



