Department of Industry and Resources

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 1292/1
Permit type: Area Permit

1.2. Proponent details

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

1.3. Property details

Property: ML 4SA (AML 70/4)
Local Government Area: Shire Of Ashburton
Colloquial name: Mt Tom Price Iron Ore Mine

1.4. Application

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

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
Beard Vegetation Association 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*. According to Shepherd et al (2001), there is approximately 100% of this vegetation type remaining in the Pilbara Bioregion. Remnant vegetation within the Mt Tom Price Iron Ore mine was surveyed in March 2004 and November 2005, identifying species from the *Mimosaceae*, *Poaceae*, *Myoporaceae*, *Caesalpiniaceae* and *Malvaceae* families dominating the vegetation (Hamersley Iron 2004; Pilbara Iron, 2006). Three weed species are known to exist within the Mt Tom Price remnant vegetation: Ruby Dock, *Acetosa vesicaria*; Buffel grass, *Cenchrus ciliaris*; and Birdwood grass, *Cenchrus setigerus* (Pilbara Iron, 2006).	The proposed clearing consists of three separate parcels of land totalling an area of 7.6ha. The largest of the three areas is approximately 6.8ha, whilst the other two areas are significantly smaller; approximately 0.55ha and 0.25ha respectively (GIS Database). The proposed clearing is within remnant vegetation on the existing Mt Tom Price iron ore mine site. Clearing will allow the expansion of iron ore mining operations within the existing mine site. Cleared vegetation will be stockpiled for use in future rehabilitation (Pilbara Iron, 2006).	Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery 1994)	Within the Mt Tom Price iron ore mine site there are areas of remnant native vegetation. These areas are referred to as the 'Tom Price Remnants'. Pilbara Iron surveyed the Tom Price Remnants on the 18th November 2005. This survey covered areas not traversed during an earlier flora survey of the Tom Price Remnants in March 2004. Information obtained from the March 2004 and November 2005 surveys has been used in the assessment of this clearing permit application.

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 areas applied to clear are within the Tom Price Remnants at the operational Mt Tom Price Iron Ore Mine (Pilbara Iron, 2006). The application areas are surrounded by extensively cleared areas, comprising mine pits, haul roads and associated infrastructure. This extensive clearing has left the areas applied to clear as small and isolated fragments of native vegetation with low connectivity to other bushland areas. As a consequence, biodiversity and habitat values have been significantly compromised.

Vegetation in the application areas has been disturbed by previous exploration activities, and common weed species such as Ruby Dock, *Acetosa vesicaria*; Buffel Grass, *Cenchrus ciliaris*; and Birdwood Grass, *Cenchrus setigerus*; have resulted in further degradation (Pilbara Iron, 2006). Shepherd et al (2001) reports that the vegetation type in the application areas (Beard Vegetation Association 82) is well represented in the Pilbara Bioregion (2,563,610ha remaining). This represents approximately 100% of the pre-European extent of this vegetation type in the Pilbara (Shepherd et al, 2001). In addition, approximately 10.2% of Beard Vegetation Association 82 is protected within conservation reserves (Shepherd et al, 2001). The loss of 7.6ha for the proposed clearing is insignificant on a regional scale.

Given that the proposed clearing areas are subject to fragmentation and disturbance from mining activities, they are unlikely to be of a higher biodiversity value than surrounding areas (DEC,2006). Furthermore, the areas applied to clear are not of greater biodiversity value than the nearby Karijini National Park, which contains substantial areas of Beard Vegetation Association 82 (GIS Database; Pilbara Iron, 2006).

The clearing as proposed is not likely to be at variance to this principle.

Methodology

DEC (2006).
GIS Database - Pre-European Vegetation - DA 01/01.
Pilbara Iron (2006).
Shepherd et al (2001).

(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

Aerial photography supplied by Pilbara Iron (2006) reveals that the areas under application are within an existing operational mine site and are highly fragmented from other pockets of native vegetation. Most of the land immediately surrounding the application areas retains little or no native vegetation and supports mining activities (Pilbara Iron, 2006). Three invasive weed species (Ruby Dock, Buffel Grass, and Birdwood Grass) have further diminished the habitat values of the areas applied to clear (Pilbara Iron, 2006).

Ninox Wildlife Consulting conducted an intensive three-day field survey between the 4 - 6 September 1991, and a subsequent literature review to identify fauna species of conservation significance possibly occurring in the North Deposit project area; 8km south-west of Tom Price (Ninox Wildlife Consulting, 1991). The North Deposit project area is in close proximity to the areas applied to clear, and is characterised by the presence of similar vegetation (GIS Database). Due to the absence of more recent information, this survey has been utilized in conjunction with the Department of Environment and Conservation (DEC) records to identify vertebrate fauna possibly occurring in the areas applied to clear.

Ninox (1991) identified three birds, one mammal and one reptile species of conservation significance which may potentially occur within the North Deposit project area. All of these species are wide-ranging across the Pilbara, and in some cases are found throughout Australia (Ninox, 1991).

One bird species, the Grey Honeyeater (*Conopophila whitei*), was identified by Ninox (1991), but is no longer listed in the *Wildlife Conservation Notice*.

The Peregrine Falcon (*Falco peregrinus*) listed under Schedule 4 (Other specially protected fauna) of the *WA Wildlife Conservation* (*Specially Protected Fauna*) *Notice 2006*, is a wide ranging bird with little habitat specificity apart from an affinity with cliffs and water where ducks and pigeons are the preferred prey species. The species builds nests in tall trees, or uses cliff faces for roosting and nesting (Ninox 1991). There were no sightings of the bird during the field inspection (Ninox, 1991). DEC records show that the Peregrine Falcon was recorded flying over a rehabilitated mine site approximately 5.5 - 6km south of the application areas in 2001 (GIS Database). According to the Biodiversity Audit of WA (CALM, 2002), the Peregrine Falcon is uncommon in the Hamersley subregion. Given the widespread habitat and distribution of the Peregrine Falcon, the proposed clearing is not likely to impact on this species.

The Grey Falcon (*Falco hypoleucos*), listed as Priority 4 on the Department of Environment and Conservation's 'Priority Fauna List', is sparsely distributed over much of Australia (Ninox, 1991; WA Museum, 2003). The species has been observed in the Karijini National Park, although it is more commonly known from the inland desert regions where it favours open country, mainly preying on birds, but occasionally taking small mammals and reptiles (Ninox, 1991). There are no CALM records of this species occurring in close proximity to the areas applied to clear (GIS Database). The proposed clearing is not likely to impact on habitat for the Grey Falcon.

The Pebble-mound Mouse (*Pseudomys chapmani*), listed as Priority 4 on the Department of Environment and Conservation's 'Priority Fauna List', was recorded in the North Deposit project area by the presence of the distinctive pebble-mounds which this animal constructs (Ninox, 1991). DEC records show that this species has been trapped in six locations approximately 3.5 - 6km south, south-southeast, and south-southwest of the areas applied to clear (GIS Database, DEC, 2006). CALM (2002) states that the Pebble-mound Mouse is widespread and abundant in the Pilbara 3 - Hamersley subregion, and that the species is not threatened or likely to be. It is unlikely that the Pebble-mound Mouse will be impacted by the proposed clearing.

The Pilbara Olive Python (*Liasis olivaceus barroni*), listed under Schedule 1 (Fauna that is rare or is likely to become extinct) of the *WA Wildlife Conservation* (*Specially Protected Fauna*) *Notice 2006*, is most frequently recorded along major drainage systems; particularly those in rocky areas with permanent or seasonal water which attract bird species (Ninox, 1991). There are no major drainage systems within the proposed clearing area (GIS Database). There are no DEC records of this species within close proximity of the clearing areas (GIS Database). The proposed clearing is not likely to impact on habitat for the Pilbara Olive Python.

DEC records show that the Australian Bustard (*Ardeotis australis*), listed as Priority 4 by the Department of Environment and Conservation's 'Priority Fauna list', has previously been sighted in two locations approximately 6km south of the application areas (GIS Database; DEC, 2006). The preferred habitat for this species is open or lightly wooded grasslands (DEC, 2006). Based on this habitat preference, the Australian Bustard may potentially occur in the application areas. However, it is unlikely that the clearing of 7.6ha of fragmented and disturbed vegetation will have a significant impact upon this species given the preferred habitat is abundant in the wider Pilbara region.

DEC records show that the Lakeland Downs Mouse (*Leggadina lakedownensis*), listed as Priority 4 by the Department of Environment and Conservation's 'Priority Fauna list', has previously been recorded approximately 5km south of the application areas (GIS Database, DEC, 2006). According to the WA Museum (2003), this species has a broad distribution throughout the Pilbara and the Kimberley. The proposed clearing is not likely to have an impact upon this species.

Based on the fragmentation and disturbance that the proposed clearing areas are subject to, it is unlikely that they provide significant habitat for indigenous fauna (DEC, 2006). Furthermore, the fauna survey by Ninox (1991) and the current records by DEC would suggest that no species of conservation significance will be threatened by the proposed clearing.

The clearing as proposed is not likely to be at variance to this principle.

Methodology

CALM (2002).
DEC (2006).
GIS Database:
- Hydrography, linear - DOE 01/02/04.
- Pre- European Vegetation - DA 01/01.
- Threatened Fauna - CALM 30/09/05.

Ninox Wildlife Consulting (1991).
Pilbara Iron (2006).
Western Australian Museum (2003).

(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

A flora survey of the Tom Price Remnants was conducted on the 18th of November 2005. One Declared Rare Flora (DRF) species was identified adjacent to the proposed clearing areas: *Lepidium catapycnon* (Pilbara Iron, 2006).

Two individual plants of *L. catapycnon* were recorded on rocky hillslopes on skeletal soils, approximately 500m from two of the proposed clearing areas (Pilbara Iron, 2006). Both plants were in poor condition, and associated vegetation included *Eucalyptus pilbarensis* and *Triodia wiseana*. The Environmental Department at Pilbara Iron has placed a 100m wide exclusion zone around this DRF location, and therefore the two DRF specimens should not be impacted by the proposed clearing (DEC, 2006).

L. catapycnon has been recorded in several locations in the Tom Price region, and also from the Yandi, Rhodes Ridge and Hope Downs areas (Pilbara Iron, 2006). CALM datasets also show several populations of this species in the regional area, including populations at Governor Ridge, Mount Robinson, Box Gorge and the upper Weeli Wolli Creek area (GIS Database).

The proposed clearing is not likely to pose a threat to the continued existence of *L. catapycnon* considering that only two plants were found in the survey area, no plants will be removed for this proposal, and the species is a disturbance specialist (CALM, 2002). Furthermore, there are several populations of *Lepidium catapycnon* throughout the Tom Price and wider Pilbara region (Pilbara Iron, 2006; GIS Database).

A flora survey of the Tom Price Remnants area in March 2004 recorded four Priority flora species: *Indigofera ixocarpa* (P2), *Olearia mucronata* (P2), *Cynanchum sp. Hamersley* (P3) and *Eremophila magnifica subsp. magnifica* (P4). Another species; *Themeda sp. Mt Barricade*, was recorded and was listed as Priority 3 at the time of the survey. This species is no longer listed as Priority Flora (Hamersley Iron, 2004).

I. ixocarpa is a shrub up to 1m high, known from skeletal red soils over ironstone (WA Herbarium, 2006). Herbarium records indicate that I. ixocarpa is restricted to the Pilbara region (WA Herbarium, 2006), with several populations recorded within and outside of the Karijini National Park (CALM, 2002). *I. ixocarpa* was found on heavily disturbed ground and sloping land at eight locations within the survey area; two of these being within the areas applied to clear. All populations were small, ranging from a single plant in three of the eight locations; up to a maximum of ten plants (Hamersley Iron, 2004). Plants were categorized as healthy and mature at all locations (Hamersley Iron, 2004). All eight populations were found growing in association with *Acacia maitlandii*, *A. hamersleyensis*, *A. marramamba* and *Triodia wiseana*.

The proposed clearing is not likely to have an impact upon the continued existence of *I. ixocarpa* given that the

populations identified in the survey area are small, only two populations are within the proposed clearing areas, the species responds well to disturbance, and there are other populations present within the Karijini National Park and the wider Pilbara area.

O. mucronata is a densely branching shrub, 0.6-1m high. This species is known from schistose hills and along drainage channels (WA Herbarium, 2006). Hamersley Iron's 2004 survey found two populations of this species on disturbed and sloping land within the application areas, whilst a further four populations were located on similar ground in the surrounding survey area. Populations of this species ranged in size from one to more than fifteen plants. *O. mucronata* was found growing in association with *Acacia maitlandii*, *A. hamersleyensis*, *A. aneura*, *A. pruinocarpa*, and *Triodia wiseana* at all six locations (Hamersley Iron, 2004).

According to the Western Australian Herbarium (2006), specimens of *O. mucronata* have been found in the Pilbara, Murchison and Goldfields regions. Considering that only two of the six populations identified in the Tom Price Remnants fall within the areas applied to clear, it is unlikely that the proposed clearing will threaten the continued existence of this species.

C. sp. Hamersley is a climber that has previously been recorded on red sandy soils, dark moist soils, amongst rocks and swampy areas throughout the Pilbara region (WA Herbarium, 2006). Two populations of this species were recorded in the survey area; however these populations are not within the areas applied to clear (Pilbara Iron, 2006). Both populations of this species were small (three and ten plants) and associated vegetation included *Acacia maitlandii*, *A. hamersleyensis* and *Triodia wiseana*. The population consisting of three plants was described as healthy, with plants climbing to 2m tall (Hamersley Iron, 2004). The larger of the two populations consisted of plants ranging in height from 0.2 - 1.5m high.

Given that the two populations of *C. sp. Hamersley* are outside of the areas applied to clear, it is unlikely that the proposed clearing will have any impact upon the existence of this species.

Only one individual plant of *E. magnifica subsp magnifica* was recorded during the flora survey in March 2004. Hamersley Iron (2004) described the solitary plant as mature, healthy, and approximately 1.2m in height and width. This plant was recorded on sloping land and does not fall within the area applied to clear. The proposed clearing is unlikely to impact upon the continued existence of *E. magnifica subsp. magnifica*.

The clearing as proposed is not likely to be at variance to this principle.

Methodology

CALM (2002).
DEC (2006).
GIS Database - Declared Rare and Priority Flora List- CALM 01/07/05.
Hamersley Iron (2004).
Pilbara Iron (2006).
WA Herbarium (2006).

(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 (TEC's) in close proximity to the areas applied to clear (GIS Database). The nearest known TEC's are the 'Themeda grasslands of the Pilbara Region' (Vulnerable TEC); approximately 36-60km northeast of the application areas (GIS Database; DEC, 2006). It is unlikely that the proposed clearing will impact upon these TEC's.

The clearing as proposed is not likely to be at variance to this principle.

Methodology

DEC (2006).
GIS Database - Threatened Ecological Communities - CALM 12/04/05.

(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 areas applied to clear are within the IBRA Pilbara Bioregion (GIS Database). According to Shepherd et al (2001) there is approximately 99.9% of the pre-European vegetation remaining in this Bioregion.

The vegetation of the application areas is classified as Beard Vegetation Association 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (Shepherd et al, 2001; GIS Database). According to Shepherd et al (2001) there is approximately 100% of this vegetation type remaining. Although the areas proposed to clear are remnants within the cleared Mt Tom Price iron ore mine, they do not represent significant remnants of vegetation in the wider region.

Therefore the clearing as proposed is not at variance to this principle.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	% in IUCN Class I-IV Reserves*
IBRA Bioregion - Pilbara	17,804,163	17,794,650	~99.9%	Least concern	6.3%
Shire of Ashburton	No information available				
Beard Vegetation Associations -					
-82	2,565,930	2,565,930	~100%	Least concern	10.2%

* Shepherd et al. (2001)
** Department of Natural Resources and Environment (2002)

Methodology Department of Natural Resources and Environment (2002)
GIS Database:
- IBRA - EA - 18/10/00.
- Pre-European Vegetation - DA 01/01
Shepherd et al. (2001).

(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 watercourses or wetlands within the areas applied to clear (GIS Database). Some minor and seasonal creeklines exist approximately 1km from the proposed clearing areas, forming part of the Ashburton River catchment (GIS Database). It is highly unlikely that the proposed clearing will have any impact upon riparian vegetation associated with these creeklines.

The vegetation applied to clear is not associated with any major watercourses or wetlands, and the proposed clearing is unlikely to significantly alter drainage patterns (GIS Database; Pilbara Iron, 2006).

The clearing as proposed is not likely to be at variance to this principle.

Methodology GIS Database:
- Hydrographic Catchments - Catchments - DOE 23/3/05.
- Hydrography, linear - DOE 01/02/04.
Pilbara Iron (2006).

(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 areas applied to clear are within the Newman Land System and are typically characterised by rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands (Department of Agriculture, 2004). Soils are stony shallow loams, and surveys of the Newman Land System reveal that approximately 99% of all soils in this Land System are unaffected by erosion (Department of Agriculture, 2004).

Given the small scale of clearing proposed, there is unlikely to be an increased risk of wind or water erosion. The proposed clearing is also unlikely to increase salinisation on or off site. Waterlogging is not expected to be an issue considering that average annual rainfall is approximately 400mm and evaporation rates are in the range of 3,400mm per annum (GIS Database).

The clearing as proposed is not likely to be at variance to this principle.

Methodology Department of Agriculture (2004).
GIS Database:
- Evaporation Isopleths - BOM 09/98.
- Rainfall, Mean Annual - BOM 30/09/01.
Pilbara Iron (2006).

(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 Karijini National Park is located approximately 12km east of the application areas (GIS Database). There are no other conservation areas nearby. The proposed clearing is associated with an existing operational mine

site and is unlikely to have any additional impacts upon the Karijini National Park. Furthermore, the application areas are unlikely to act as an ecological linkage to the Karijini National Park given that they are highly fragmented and surrounded by mining operations (Pilbara Iron, 2006).

The clearing as proposed is not likely to be at variance to this principle.

Methodology GIS Database - CALM Managed Lands and Waters - CALM 01/07/05.
Pilbara Iron (2006).

(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 surface water features within the vicinity of the areas applied to clear, and the proposed clearing is unlikely to impact on surface water quality (GIS Database). The areas applied to clear slope gradually uphill to the north, and during times of significant rainfall surface water run-off drains towards the existing mine pit (Pilbara Iron, 2006). The proposed clearing is not likey to have a significant impact upon this flow regime.

Groundwater salinity in the Tom Price region is 500-1000 mg/ total dissolved solids/L (GIS Database), and it is unlikely that the small scale of clearing proposed will have any impact upon salinity levels or on the depth of the water table.

The clearing as proposed is not likely to be at variance to this principle.

Methodology GIS Database:
- Hydrography, linear - DoE 01/02/04.
- Groundwater Salinity, Statewide - 22/02/00.

(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 average annual rainfall of the proposed clearing areas is approximately 400mm, whilst average annual evaporation rates are in the range of 3,400mm (GIS Database). It is therefore expected that there would be little surface flow during normal seasonal rains. The application areas slope gradually uphill to the north, with a gradient of 10 metres across the site (GIS Database). Drainage is towards the existing mine pit (Pilbara Iron, 2006). This further reduces the likelihood of flooding.

There are no permanent watercourses in the vicinity of the application areas, and the clearing of such a small area will not create a catchment area large enough to increase the incidence of flooding (GIS Database). Seasonal flooding occurs naturally in the Pilbara between December and March when there is significant rainfall associated with cyclonic activity (Pilbara Iron, 2006). The clearing as proposed is unlikely to cause or exacerbate the incidence or intensity of natural flood events.

The clearing as proposed is not likely to be at variance to this principle.

Methodology GIS Database:
- Evaporation Isopleths - BOM 09/98
- Hydrography, linear - DOE 01/02/04.
- Rainfall, Mean Annual - BOM 30/09/01.
- Topographic Contours, Statewide – DOLA 12/09/02.

Pilbara Iron (2006).

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

Comments

There is one native title claim over the areas under application. This claim (WC97/089) has been registered with the National Native Title Tribunal (GIS Database). However, the mining 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*.

There are no known sites of Aboriginal significance within the areas 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.

Methodology GIS Database:
- Aboriginal Sites of Significance - DIA 04/07/02.
- Native Title Claims - DLI 19/12/04.

4. Assessor's recommendations

Purpose	Method	Applied area (ha)/ trees	Decision	Comment / recommendation
Mineral Production	Mechanical Removal	7.6	**Grant**	The clearing principles have been addressed and the proposal is either not at variance or not likely to be at variance to any of the clearing principles. The assessing officer therefore recommends that the permit should be granted.

5. References

CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions: Pilbara 3 (PIL3 – Hamersley subregion).

Department of Agriculture (2004) Technical Bulletin No. 92: An inventory and condition survey of the Pilbara region, Western Australia, Department of Agriculture, South Perth.

DEC - Biodiversity Coordination Section (2006) Land clearing proposal advice. Advice to assessing officer, Native Vegetation Assessment Branch, Department of Industry and Resources (DoIR) - Department of Environment and Conservation, 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.

Hamersley Iron Pty Ltd (2004) Tom Price Remnant Rare Flora Survey, Hamersley Iron 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.

Ninox Wildlife Consulting (1991). An Assessment of the Vertebrate Fauna of the North Deposit, Tom Price. Prepared for Hamersley Iron Pty Ltd, September 1991

Pilbara Iron (2006) Application for an Area Clearing Permit for the mining expansion at Mt Tom Price Iron Ore Mine, Pilbara Iron, Western Australia.

Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia (updated 2005).

Western Australian Herbarium (2006). Florabase - The Western Australian Flora. Department of Environment and Conservation. http://florabase.calm.wa.gov.au/

Western Australian Museum (2003). Faunabase and WA Faunalist, Western Australian Museum. http://www.museum.wa.gov.au/faunabase/prod/

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.
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.
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 **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.