



1. Application details

1.1. Permit application details

Permit application No.: 928/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: BHP Billiton Iron Ore Pty Ltd

1.3. Property details

Property: ML 244SA (AML 70/244)
Local Government Area: Shire of East Pilbara
Colloquial name: Orebody 24 and Orebody 25

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
48.75		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	Clearing Description	Vegetation Condition	Comment
Beard Vegetation Association 18: low woodland; mulga (<i>Acacia aneura</i>), and Beard Vegetation Association 82: hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i> (GIS Database). According to Shepherd et al. (2001) there is approximately 99.9% and 100% respectively of these vegetation types remaining, and 2.3% and 9.1% respectively, in reserves.	<p>Orebody 25: The vegetation of the application area consists of <i>Triodia basedowii</i> steppe with a sparse to very sparse overstorey of <i>Eucalyptus</i> emergents, typically including <i>E. leucophloia</i> (Ecologia, 1995).</p> <p>Orebody 24: The vegetation of the application area was mapped by Ecologia (2004a), using a combination of quadrats and transects, and six vegetation types were identified, broadly associated with topographic features:</p> <p>(1) Range: <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>, over <i>Gompholobium polyzygum</i>, <i>Acacia hilliana</i>, <i>Calytrix carinata</i>, low shrubs with <i>Triodia pungens</i> and <i>Eriachne pulchella</i> subsp. <i>dominii</i> understorey.</p> <p>(2) Range slopes: <i>E. leucophloia</i> subsp. <i>leucophloia</i> with scattered <i>Corymbia hamersleyana</i> over <i>Dampiera candicans</i>, <i>Gompholobium polyzygum</i>, <i>Acacia hilliana</i> and <i>Solanum lasiophyllum</i> low shrubs, over <i>Eriachne lanata</i> with scattered <i>Triodia pungens</i>.</p> <p>(3) Breakaways: Scattered <i>E. leucophloia</i> subsp. <i>leucophloia</i> over <i>Cymbopogon obtectus</i>, <i>Dampiera candicans</i>, <i>Ptilotus obovatus</i> var. <i>obovatus</i> and mixed grasses.</p> <p>(4) Gorges & Gullies: Dense <i>E. leucophloia</i> subsp. <i>leucophloia</i> with occasional <i>Corymbia ferritcola</i> and <i>Corymbia hamersleyana</i> over mixed shrubs, over <i>Triodia pungens</i>.</p> <p>(5) Minor channels: <i>E. leucophloia</i> subsp. <i>leucophloia</i> with occasional <i>Corymbia hamersleyana</i> over <i>Dodonaea coriacea</i> and <i>Gossypium robinsonii</i> over mixed lower strata shrubs, over soft grass and hummock grass.</p> <p>(6) Valley Plains: <i>Acacia bivenosa</i> dominated open shrubland over mixed tussock grass interspersed with <i>Triodia</i> steppe (Ecologia, 2004a).</p> <p>Four weed species were recorded within the survey area: Ruby Dock, <i>Acetosa vesicaria</i>; Bipinnate Beggartick, <i>Bidens bipinnata</i>; Buffel grass, <i>Cenchrus ciliaris</i>; and Spiked Malvastrum, <i>Malvastrum americanum</i> (Ecologia, 2004a).</p>	Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)	The area proposed to clear is a total of approximately 48.75ha, consisting of approximately 42.5ha at Orebody 24, and approximately 6.25ha at Orebody 25. The proposed clearing is for the purpose of reserve evaluation drill pads, and access tracks, and will occur within two defined areas totalling approximately 842 ha.

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 vegetation types and fauna habitats in the application areas are well represented in the Pilbara Region (Ecologia, 2004a; GIS Database), and the areas proposed to clear are unlikely to be of higher biodiversity than surrounding areas.

Some flora and fauna of conservation significance are known to occur within the application areas, however these species are not expected to be impacted as a consequence of the proposed clearing.

The sparse nature of the proposed clearing for exploration drill pads and access tracks is unlikely to have any significant impact on the biological diversity of the region.

After examining the supporting documentation, CALM database information, and Regional CALM advice, CALM's Clearing Assessment Unit is satisfied that the biodiversity values of the application areas have undergone adequate assessment by the proponent and this has been articulated sufficiently in the DoIR assessment report (CALM, 2006). CALM has had close ongoing involvement with the proponent for various large-scale mining projects in the area and is satisfied that the management of impacts to flora and fauna species of conservation significance for this exploration proposal can be covered under existing environmental management systems (CALM, 2006).

Methodology CALM (2006).
Ecologia (2004a).
GIS Database - Pre-European Vegetation - DA 01/01.

(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**

Orebody 25:

A fauna survey of the Orebody 25 minesite conducted by Ecologia in June 1995 recorded a total of 52 fauna species (three mammals, 40 birds and nine reptiles) within the spinifex steppe vegetation association, which is the dominant vegetation type within the application area.

No fauna species of conservation significance were recorded within the area proposed to clear (BHP Billiton, 2005). However, two fauna species of conservation significance were recorded in the surrounding area: the Western Pebble-mound Mouse, *Pseudomys chapmani* (P4); and the Peregrine Falcon, *Falco peregrinus* (Schedule 4) (Ecologia, 1995).

One active mound of the Western Pebble-mound Mouse was recorded within the Orebody 25 survey area (Ecologia, 1995). This species is relatively widespread in the Pilbara, and is well represented in areas outside the minesite. The Peregrine Falcon has been recorded in areas adjacent to the minesite, however this species is highly mobile and is unlikely to be affected by the proposed clearing (Ecologia, 1995). Abandoned nests of the Lesser Stick-nest Rat, *Leporillus apicalis* (currently listed by CALM as Extinct, (CALM, 2005) were recorded from two small caves within the Orebody 25 survey area, however these nests was estimated to have been abandoned for several decades (Ecologia, 1995).

The landforms and vegetation type found in the application area are widespread in the Pilbara region (Ecologia, 2004b; GIS Database), and the comparatively small area of additional clearing within the Orebody 25 operational minesite is unlikely to have any significant impact on fauna habitat in the region.

Orebody 24:

Ecologia conducted a fauna survey of the application area in May 2004. Four fauna species of conservation significance were recorded during the survey. These included three species listed as Lower Risk/Near Threatened (the least threatened category) on the IUCN RedList: Desert Mouse, *Pseudomys desertor*; Yellow-bellied Sheath-tail Bat, *Saccolaimus flaviventris*; White-striped Mastiff bat, *Tadarida australis* and one migratory bird: the Rainbow Bee-eater, *Merops ornatus*. One active mound of the Western Pebble Mound Mouse, *Pseudomys chapmani* (P4) was recorded within the survey area (Ecologia, 2004a).

The Desert Mouse has a wide distribution and is locally common in arid Australia (Ecologia, 2004a). The elusive Yellow-bellied Sheath-tail Bat is not often sighted, however it is widespread throughout northern Australia and may be more common than known (Ecologia, 2004a). The White-striped Mastiff bat occupies a wide range of habitats and has been found throughout Western Australia, except for the Kimberley Region (Ecologia, 2004a). Both bat species are highly mobile and it is unlikely that the proposed clearing will have any significant impact on their habitat. The Rainbow Bee-eater has a wide distribution across Australia, covering a broad habitat range (Ecologia, 2004a).

The application area contains habitat suitable for several other fauna species of conservation significance, although these were not recorded during the survey: Night Parrot *Pezoporus occidentalis* (CR); Pilbara Olive

Python, *Liasis olivaceus barroni* (VU); Bilby, *Macrotis lagotis* (VU); Black-footed Rock Wallaby, *Petrogale lateralis lateralis* (VU); Orange or Pilbara Leaf-nosed Bat, *Rhinonicteris aurantius* (VU); Ghost Bat *Macroderma gigas* (VU); Unpatterned Robust Lerista, *Lerista macropisthopus remota* (P2); Australian Bustard *Ardeotis australis* (P4); and Bush Stone-curlew *Burhinus grallarius* (P4). The following species of conservation significance have distributions extending into the application area: Grey Falcon, *Falco hypoleucos* (P4); Star Finch, *Neochmia ruficauda clarescens* (P4); and Spectacled Hare-wallaby, *Lagorchestes conspicillatus leichardti* (P3). Of these species, the Pilbara Olive Python and the Black-footed Wallaby are considered most likely to occur within the application area (Ecologia, 2004a).

The Pilbara Olive Python was not recorded during the survey, however it may occur in rock-pools in gullies within the application area. This species is widespread across the Pilbara (Ecologia, 2004a). Rock-pools will not be disturbed by the proposed exploration activities and it is unlikely that the proposed clearing will impact on the habitat of this species. Although *Petrogale sp.* were recorded within the application area, it is unclear whether the individuals sighted were Black-footed Rock Wallaby or the more common Rothschild's Rock Wallaby, as the ranges of these two species appear to overlap (Ecologia, 2004a). The Black-footed Rock Wallaby prefers steep, rocky habitats, and such areas are unlikely to be impacted by the proposed exploration activities.

The fauna habitats occurring within the Orebody 24 application area are well represented within the Karijini and Chichester Range National Parks, and in the Pilbara region generally (Ecologia, 2004a).

The sparse nature of the proposed clearing of approximately 48.75ha spread over a total area of approximately 842ha is unlikely to have any significant impact on fauna habitat in the region.

CALM is satisfied that the management of impacts to fauna species of conservation significance for this exploration proposal can be covered under existing environmental management systems (CALM, 2006).

Methodology BHP Billiton (2005).
CALM (2005).
CALM (2006).
Ecologia (1995).
Ecologia (2004a).
Ecologia (2004b).
GIS Database - Pre-European Vegetation - DA 01/01.

(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

The nearest known Declared Rare Flora are six populations of *Lepidium catapycnon* which occur fairly close together approximately 11-15km west/southwest of the application area (GIS Database). CALM databases have no records of any other populations of Declared Rare or Priority flora within a 50km radius of the areas applied to clear (GIS Database).

Orebody 25:

A vegetation survey of the Orebody 25 minesite conducted by Ecologia in June 1995 described the vegetation of the application area as *Triodia basedowii* steppe with a sparse to very sparse overstorey of *Eucalyptus* emergents, typically including *E. leucophloia*. This vegetation type is well represented in the Pilbara Region (Ecologia, 1995, 2004b; GIS Database).

No Rare or Priority flora species have been found within the area applied to clear at Orebody 25, however two Priority Flora species have been recorded in the surrounding area. *Eremophila magnifica* was recorded by Ecologia in 1995, and by BHP Billiton in 2000 (Ecologia, 2004b). A targeted search conducted by Ecologia in 2004, recorded large numbers in an area to the west of the Orebody 25 minesite (Ecologia, 2004b). *Eremophila magnifica* is now classified on the CALM Florabase database as 'not threatened', however two subspecies are listed as Priority Flora: *E. magnifica subsp magnifica* (P4) and *E. magnifica subsp velutina* (P3). The CALM Florabase database (WA Herbarium, 2006) has records for all three subspecies in the Pilbara region, from areas outside the minesite. *Triumfetta leptacantha* (P3) was recorded by BHP Billiton in 2000 from the area surrounding the Orebody 25 minesite, however subsequent searches by Ecologia in 2004, failed to relocate this species (Ecologia, 2004b). *Triumfetta leptacantha* is a small shrub, which grows on rocky outcrops on upper slopes throughout the Pilbara (Ecologia, 2004b).

Orebody 24:

Ecologia conducted a flora survey of the area proposed to clear in May 2004, and identified six vegetation types within the application area, broadly associated with topographic features (Ecologia, 2004a).

An additional survey for Declared Rare and Priority Flora conducted in August 2004 (Ecologia, 2004a) recorded three species of Priority Flora: three populations of *Tephrosia sp. Cathedral Gorge* (P3), one population of *Isotropis winneckeii* (P1), and one population of *Triumfetta leptacantha* (P3). As *Lepidium catapycnon* (R) is known to occur in the local area it was specifically searched for during the survey, however neither it nor any

other species of Declared Rare Flora was found within the application area (Ecologia, 2004a).

Tephrosia sp. Cathedral Gorge (P3) is a low erect shrub, known from several populations in the Pilbara (Ecologia, 2004a). *Isotropis winneckeii* (P1) is a perennial herb found on sandstone ridges and rocky rises, and has been previously recorded at Eastern Ophthalmia Range (Ecologia, 2004a).

The populations of the three Priority Flora species will be marked and avoided during the proposed clearing (BHP Billiton, 2005a).

The proposed clearing of 48.75 ha spread over a total area of approximately 842 ha is unlikely to have any significant impact on any Declared Rare or Priority flora.

CALM is satisfied that the management of impacts to flora species of conservation significance for this exploration proposal can be covered under existing environmental management systems (CALM, 2006).

Methodology BHP Billiton (2005a).
 CALM (2006).
 Ecologia (1995).
 Ecologia (2004a).
 Ecologia (2004b).
 GIS Database:
 - Declared Rare and Priority Flora List - CALM 01/07/05.
 - Pre-European Vegetation - DA 01/01.
 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) within the area applied to clear (GIS Database). The nearest known TEC is the Ethel Gorge aquifer stygobiont community which is located approximately 1.6 km east of the northern application area (GIS Database). Groundwater drawdown is listed as a threatening process for the Ethel Gorge stygofauna (CALM, 2002), however the proposed clearing is not expected to have any effect on groundwater levels.

Methodology CALM (2002).
 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 application area falls within the IBRA Pilbara Bioregion and the Shire of East Pilbara. Shepherd et al. (2001) report that approximately 100% of the pre-European vegetation still exists in the IBRA Pilbara Bioregion, although no specific information is available for the Shire of East Pilbara. The vegetation in the application area is recorded as Beard Vegetation Association 18: low woodland; mulga (*Acacia aneura*), and Beard Vegetation Association 82: hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*. Shepherd et al, (2001) report that there is approximately 99.9% and 100% respectively of these vegetation types remaining, and 2.3% and 9.1% respectively, in reserves. The area proposed to clear does not represent a significant remnant of native vegetation (Ecologia, 2006).

	Pre-European area (ha)	Current extent (ha)	Remaining %*	Conservation Status**	% in reserves/CALM-managed land
IBRA Bioregion - Pilbara	17,944,694*	17,944,694*	100%	Least concern	
Shire of East Pilbara	No information available				
Beard vegetation associations					
- 18	24,675,970	24,659,110	99.9%	Least concern	2.3%
- 82	2,920,910	2,920,910	~100%	Least concern	9.1%

* Shepherd et al. (2001)

** Department of Natural Resources and Environment (2002)

Methodology Dept of Natural Resources and Environment (2002).
 GIS Database: 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 permanent watercourses or wetlands within the areas proposed to clear (GIS Database). Creeks in the surrounding area are dry for most of the year, only flowing briefly immediately following significant rainfall (BHP, 2005b). There are six minor seasonal creeklines within the larger northern application area (Orebody 24 area), and one seasonal creekline passing through the smaller southern application area (Orebody 25 area).

The proposed clearing is unlikely to have any significant impact on any watercourse or wetland.

Methodology BHP Billiton (2005b).

GIS Database:

- Hydrography, Linear - DOE 01/02/04.

- Lakes, 1M - GA 01/06/00; GIS Database - Rivers 250K - GA.

(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

There are no recorded acid sulphate soils in the area and the clearing is unlikely to result in an increased risk of salinity (GIS Database).

Orebody 24:

The Orebody 24 area lies within the Rocklea and Boolgeeda Land Systems. The Rocklea Land System consists of basalt hills, plateaux, lower slopes and minor stony plains. This land system has a very low erosion risk under pastoral use, however vegetation clearing may create an accelerated risk of erosion in drainage lines and channels (DAWA, 2006).

The Boolgeeda Land System consists of stony slopes and plains below hill systems. This land system is regarded as being not susceptible to soil erosion under pastoral use, however vegetation clearing may create a minor risk of erosion in drainage lines (DAWA, 2006).

The proponent has advised that appropriate measures will be implemented to minimise erosion and groundwater run-off. Clearing across drainage lines will be avoided wherever possible, and bunds will be established around the perimeter of drilling pads to reduce the likelihood of surface water run-off (BHP, 2005). Consequently the proposed clearing is unlikely to cause appreciable land degradation.

Orebody 25:

The Orebody 25 area lies within the Newman Land System, which consists of jaspelite plateaux ridges and mountains. This land system is generally not prone to soil erosion (DAWA, 2006).

The proposed clearing is unlikely to cause appreciable land degradation (DAWA Advice, 2006).

Methodology BHP (2005).

DAWA Advice (2006).

GIS Database:

- Acid Sulphate soil risk map, SCP - DOE 4/1/04.

- Salinity Risk LM 25m - DOLA 00.

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

Comments Proposal is not at variance to this Principle

There are no conservation areas in the vicinity of the application area. The nearest CALM managed lands are the Collier National Park, approximately 120km south/southwest of the application area; and the Karijini National Park, approximately 120km northwest of the application area (GIS Database). The proposal is not likely to be at variance to this principle.

Methodology GIS Database: CALM Managed Lands and Waters - CALM 1/07/05.

(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 Orebody 25 application area and approximately 8% (the eastern end) of the Orebody 24 application area is located within the Newman Water Reserve, a Public Drinking Water Source Area (GIS Database). DoE considers that any impacts on ground or surface water quality resulting from the relatively small area of additional clearing within the PWSA can be adequately managed and monitored by the existing Ground Water Licence Operating Strategy for Newman (DoE, 2006).

Creeklines and gullies within the application area feed into Homestead Creek, which flows into the Fortescue River. Creeklines are dry most of the year, only flowing briefly following significant rainfall (BHP Billiton, 2005b). Groundwater quality monitoring is conducted as part of the existing mine operations at the adjacent Orebody 25 minesite (BHP Billiton, 2005b).

The sparse nature of the proposed clearing is unlikely to cause deterioration in the quality of any surface or underground water.

Methodology BHP Billiton (2005b).
DoE (2006).
GIS Database:
- Hydrography, Linear - DOE 1/02/04.
- Public Drinking Water Source Areas - DOE 09/08/05.

(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

Natural flooding occurs occasionally during the wet season (November to March) following significant rainfall (BHP, 2005a).

There are no permanent watercourses within the application area. The proposed clearing of 48.75 ha spread over a total area of approximately 842 ha is not likely to cause or exacerbate the incidence or intensity of flooding.

Methodology BHP Billiton (2005a).

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

Comments

There is a native title claim (WC99/004) over the area under application. This claim has been registered with the National Native Title Tribunal on behalf of the Nyiyaparli claimant group. 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 (ie. 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 twenty Aboriginal sites of significance recorded as occurring wholly or partly 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.

An Environmental Protection Licence and a Works Approval Licence are not required for the proposed exploration drilling (DoE, 2006).

The proponent has advised that any water required for dust suppression during the proposed exploration drilling will be drawn from existing licensed water sources GWL65219(4) and GWL74556(4). These Licences allow for the use of water for dust suppression, however should the required water exceed the current allocation of these licences, the proponent will need to apply for an amendment to the water licence under the *Rights in Water and Irrigation Act 1914* (DoE, 2006).

The Environmental Protection Authority (EPA) conducted a Formal Assessment (assessment level: Environmental Protection Statement) of the Orebody 25 Expansion Project in 2005 and the assessment report and recommendations were published in EPA Bulletin 1210, issued in November 2005. The EPA assessment area partly overlaps the southern clearing application area. However, the EPA assessment did not consider exploration activities, and the EPA Service Unit has advised that assessment of vegetation clearing for exploration purposes at this site can proceed under the Clearing Permit assessment process (EPA Advice, 2006).

Methodology DoE Advice (2006).
EPA Advice, pers. comm. (2006).
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 Exploration	Mechanical Removal	48.75	Grant	<p>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, subject to the following Permit Conditions:</p> <ol style="list-style-type: none">1. The Permit Holder shall record the following for each instance of clearing:<ol style="list-style-type: none">a) location where clearing occurred;b) purpose of clearing;c) area cleared in hectares;d) area rehabilitated in hectares.2. The Permit Holder shall provide a report to the Director, Environment Division, Department of Industry and Resources by 1 September each year, setting out the records required under condition 1 of this permit in relation to clearing carried out between 1 July and 30 June of the previous financial year. This report can be included as part of the Annual Environmental Report submitted to DoIR.3. The Permit Holder shall implement appropriate erosion control measures to minimise potential erosion within the Clearing Permit Areas and adjacent areas.4. The Permit Holder shall retain the vegetative material and topsoil removed by clearing in accordance with this Permit and shall, within twelve months, lay the vegetative material and topsoil on the cleared area.5. Condition 4 ceases to have effect if future clearing of the areas cleared in accordance with this Permit is approved by the Environmental Protection Authority for the purpose of development of the Orebody 24 minesite.

5. References

- BHP Billiton (2005a) Orebody 24 and Orebody 25 clearing permit application for reserve evaluation drilling. BHP Billiton Iron Ore Pty Ltd, Western Australia.
- BHP Billiton (2005b) Orebody 25 Mine - Interim Pit 1 Mining and Overburden Optimisation Proposal - Notice of Intent. BHP Billiton Iron Ore Pty Ltd, Western Australia.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.
- CALM (2005) Declared Threatened Fauna occurrence in CALM Regions (wild populations). Department of Conservation and Land Management, Western Australia.
- CALM (2006) Land clearing proposal advice. Advice to Program Manager, Native Vegetation Assessment Branch, Department of Industry and Resources (DoIR). Department of Conservation and Land Management, Western Australia.
- DAWA (2006) Land degradation assessment report. Office of the Commissioner of Soil and Land Conservation, Department of Agriculture 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.
- DoE (2006) Water Allocation/Licence Advice. Department of Environment, Western Australia.
- Ecologia (1995) Orebody 25 Biological Assessment Survey. Ecologia Environment, Western Australia.
- Ecologia (2004a) Mine and Port Development Joint Venture Orebody 24 Expansion Biological Survey. Ecologia Environment, Western Australia.
- Ecologia (2004b) Orebodies 18, 23 & 25 Flora and Fauna Review. Ecologia Environment, Western Australia.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Shepherd, D.P., 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.
- Western Australian Herbarium (1998-2006) FloraBase - The Western Australian Flora. Department of Conservation and Land Management, 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.
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.