



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 3550/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Hamersley Iron Pty Ltd

1.3. Property details

Property: Miscellaneous Licence 47/18
Miscellaneous Licence 47/55
Iron Ore (Hamersley Range) Agreement Act 1963, Mining Lease 272 SA (AM70/272)
Local Government Area: Shire of Ashburton
Colloquial name: Minthdi Spring Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
1.075		Mechanical Removal	Hydrogeological investigations

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description Beard Vegetation Associations have been mapped at a scale of 1:250,000 for the whole of Western Australia. Two Beard Vegetation Associations are located within the application areas (Shepherd, 2007):

Beard Vegetation Association 18: Low woodland; mulga (*Acacia aneura*);

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

Numerous flora and vegetation studies have occurred within the vicinity of the Marandoo Project Area and two of these surveys have been included in support of the clearing permit application. The first survey was conducted by Mattiske and Associates (Mattiske) in 1990/91 and summarised findings of field programmes undertaken in the period from 1974 to 1991 (Mattiske, 1992). The second survey was conducted by Biota Environmental Sciences (Biota) in Autumn 2008 and included a desktop review, in addition to a field survey. This survey was conducted over a distance of approximately 120 kilometres. These surveys identified the following eight vegetation units as potentially occurring within the application areas (Mattiske, 1992; Biota, 2008a):

Broad Drainage Areas and Basins

1: Hummock Grassland of *Triodia melvillei*

This plant community is relatively restricted. Thus, although it is quite extensive locally, it is restricted on a regional level. A range of emergent species of *Acacia* and *Eucalyptus* also occur in this community.

Minor Creeks

2: Low Shrubland of mixed *Acacia* species

This community is associated with the small flow-lines through the ranges and erosional spurs. This plant community is very widespread in the Pilbara region. Local variations are a reflection of underlying soil conditions and adjacent plant communities.

Low Foothills and Escarpments

3: Low woodlands of mixed mallee species *Eucalyptus trivalvis*, *Eucalyptus socialis* and *Eucalyptus socialis*, with pockets of *Triodia angusta* and *Triodia wiseana* on shallow calcrete soils.

Although generally restricted within the Marandoo project area, this community is relatively widespread in the Pilbara region.

4: Low woodlands of mixed mallee species *Eucalyptus trivalvis*, *Eucalyptus socialis* and *Eucalyptus socialis*, with pockets of *Triodia angusta* and *Triodia longiceps* on the small moister eroded darker soils near vegetation unit 3.

This vegetation unit occurs downslope from vegetation unit 3, in the moister and more alluvial areas which lie on the calcrete soils. This community, although generally restricted in the Marandoo Project Area, is relatively widespread in the Pilbara region.

5: Low woodlands of mixed mallee species *Eucalyptus trivalvis*, *Eucalyptus socialis* and *Eucalyptus socialis*, with pockets of *Triodia angusta* and *Triodia wiseana* on shallow calcrete soils.

This plant community has a strong development of understorey species, including *Melaleuca eleuterostachya*, and as such is a variant of vegetation unit 3. This community, although generally restricted in the Marandoo Project Area, is relatively widespread in the Pilbara region.

Vegetation of Stony Plains

6: *Eucalyptus socialis* low open mallee woodland over *Triodia wiseana* hummock grassland

The vegetation type was recorded from calcrete footslopes of the Boolgeeda and Table land systems. Other associated species included *Acacia bivenosa* (wispy/weeping form), *Anthobolus leptomerioides*, *Capparis umbonata*, *Eucalyptus gamophylla*, *Heliotropium chrysocarpum*, *Melaleuca eleuterostachya*, *Ptilotus clementii*, *P. exaltus* var. *exaltus* and *Triodia angusta*. This vegetation was in Excellent condition.

Vegetation of Clayey Plains

7: *Acacia aneura*, *A. pruinocarpa* low open woodland over *A. pachyacra* scattered shrubs over *Aristida ingrata* tussock grassland and *Triodia melvillei* hummock grassland

This vegetation type was recorded from broad clay-loam plains, and was most strongly associated with the Boolgeeda and Wannamunna land systems. Many of the mature trees of *Acacia* were re-generating following a large fire. Other associated species included *Acacia pruinocarpa*, *Alternanthera nana*, *Aristida holathera*, *Cucumis maderaspatanus*, *Cymbopogon obtectus*, *Digitaria brownii*, *Eragrostis eriopoda*, *Goodenia microptera*, *Ptilotus obovatus* and *Solanum fercissimum*. This vegetation type was in Excellent condition.

8: *Eucalyptus xerothermica* low open woodland over *Themeda triandra* closed tussock grassland

This vegetation type was recorded from a calcrete-based flowline crossing the Boolgeeda and Table land systems. Other associated species included *Acacia dictyophleba*, *A. inaequilatera*, *Cucumis maderaspatanus*, *Eulalia aurea*, *Goodenia stellata*, *Phyllanthus maderaspatensis*, *Rhynchosia minima*, *Scaevola amblyanthera* and *Stemodia grossa*. Vegetation condition was classed as Very Good to Excellent.

Clearing Description

Hamersley Iron (2010) proposes to clear up to 1.075 hectares of native vegetation, within an area equalling approximately 1.24 hectares. The western-most application area is located approximately 40 kilometres east of Tom Price (GIS Database).

The purpose of the proposed clearing is for the construction of monitoring bores to determine the permeability of the sub-surface clay layer and therefore the groundwater/aquifer characteristics (Hamersley Iron, 2010). Vegetation will be cleared by bulldozer and vegetation and topsoil will be stockpiled for rehabilitation purposes (Hamersley Iron, 2010).

Vegetation Condition

Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994)

Comment

The flora and vegetation surveys conducted by Biota (2008a) and Matiske (1992) class the vegetation condition as varying from 'Very Good' to 'Excellent'. These surveys were not specific to the application areas and were conducted over large areas of land. Aerial photographs of the application areas provided with the clearing permit application indicate that the application areas have suffered from prior disturbance due to their location adjacent to existing roads and tracks. The result of this is that the application areas appear to have quite sparse vegetation within them and the vegetation remaining would be expected to be in a quite degraded condition.

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

Numerous weed species have previously been identified within the Marandoo Project Area (Biota, 2008a). The presence of introduced weed species lowers the biodiversity value of the proposed clearing areas. Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. The risk of spreading weed species can be mitigated by imposing a condition for the purpose of weed management.

Numerous flora and vegetation studies have occurred within the vicinity of the Marandoo Project Area and two of these surveys have been included in support of the clearing permit application. The 1990/91 survey

conducted by Mattiske identified a total of 462 vascular plant species from 68 families within the Marandoo Project Area. Mattiske (1992) interpreted that the project area was not particularly rich in vascular plant species but rather that it showed more of an indication of the wide distribution of most plant species found in the Eremaean areas.

A flora and vegetation survey was conducted by Biota Environmental Sciences in 2008 over a 120 kilometre corridor. This survey identified a total of 331 native vascular flora taxa from 136 genera belonging to 46 families (Biota, 2008a). Biota (2008a) reports that the number of species recorded from the project area appeared relatively low for an area of its size and relates this to being a reflection of the limited range of habitats encompassed by the study area, the dry conditions at the time of sampling and the considerable areas of burnt or otherwise disturbed vegetation within the corridor.

A fauna survey was conducted by Biota Environmental Sciences in May 2008 over a 120 kilometre corridor. This survey identified 67 avifauna species, 18 mammals, 33 reptiles and 2 frogs (Biota, 2008b). These results indicate that the survey area has a fairly high bird diversity. Biota (2008b) reports that these findings are in keeping with other surveys conducted in the locality.

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

Methodology Biota (2008a)
Biota (2008b)
CALM (2002)
Mattiske (1992)
GIS Database
- Interim Biogeographical Regionalisation of Australia

(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 Environmental Sciences conducted a fauna survey of a 120 kilometre corridor which included the application areas in May 2008. Biota (2008b) reports that the survey consisted of systematic fauna sampling centred on fourteen trapping grids of ten pit-traps in environments considered to represent the range of habitats available within the study area. This survey identified the following fauna habitats within the survey area (Biota, 2008b):

1. *Acacia xiphophylla* (snakewood) over grasses on cracking clay;
2. *Acacia* and *Eucalypts* over *Triodia* on a stony slope;
3. Scattered *Eucalypts* over grasses on loam;
4. *Acacia aneura* (mulga) over *Triodia* on loam;
5. Creekline with *Acacia* and *Eucalypts* over grasses;
6. *Acacia* shrubland over *Triodia* on loam; and
7. Themeda grassland on loam.

Based on the vegetation descriptions provided by Mattiske (1992) and Biota (2008a), fauna habitat 1 is unlikely to occur within the application areas.

The proposed clearing areas are located immediately adjacent to a pre-existing track and have therefore suffered prior disturbance. In addition, the application areas consist of 5 small areas spread out over an 8.5 kilometre distance, with the largest of the proposed clearing areas equalling approximately 0.46 hectares. Given this, the amount of proposed clearing to occur within each habitat unit is likely to be minimal and therefore will not significantly impact fauna habitat.

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

Methodology Biota (2008a)
Biota (2008b)
Mattiske (1992)

(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

Mattiske conducted a flora and vegetation survey in 1990/91 and Biota Environmental Sciences conducted a flora and vegetation survey in May 2008. Both surveys consisted of a desktop survey in addition to a field survey (Mattiske, 1992; Biota, 2008a).

Neither of these surveys identified any Declared Rare Flora species or Priority flora species from within the application areas. Furthermore, the proposed clearing of 1.075 hectares of native vegetation, within areas that are already disturbed, is unlikely to affect the conservation status of any conservation significant flora.

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

Methodology Biota (2008a)
Matiske (1992)

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

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

There are no known Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) within the areas applied to clear (GIS Database). The nearest known TEC is the Themeda Grasslands located approximately 35 kilometres north-west of the closest application area (Hamersley Iron, 2010; GIS Database). The nearest known PEC is located approximately 2.5 kilometres north-east of the closest application area (GIS Database).

Biota (2008a) and Matiske (1992) report that no TECs or PECs were identified within the application areas during the flora and vegetation surveys.

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

Methodology Biota (2008a)
Hamersley Iron (2010)
Matiske (1992)

(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 areas fall within the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). Shepherd (2007) reports that approximately 100% of the pre-European vegetation still exists within this bioregion (see table below). The vegetation within the application areas is recorded as the following two Beard Vegetation Associations (Shepherd, 2007):

- **Beard Vegetation Association 18:** Low woodland; mulga (*Acacia aneura*); and
- **Beard Vegetation Association 567:** Hummock grasslands, shrub steppe; mulga and kanji over soft spinifex and *Triodia basedowii*.

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

Therefore, the vegetation within the application areas is not 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	17,804,188	17,794,647	~100	Least Concern	~6.3
Beard vegetation associations - State					
18	19,892,305	19,890,195	~100	Least Concern	~2.1
567	777,507	777,507	~100	Least Concern	~22.3
Beard vegetation associations - Bioregion					
18	676,557	676,557	~100	Least Concern	~16.8
567	776,824	776,824	~100	Least Concern	~22.4

* Shepherd (2007)

** Department of Natural Resources and Environment (2002)

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd (2007)
GIS Database
- Interim Biogeographic Regionalisation of Australia

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments Proposal is at variance to this Principle

According to available databases there is one ephemeral watercourse within one of the application areas (GIS Database). It is the proponent's responsibility to liaise with the Department of Water to determine whether a Bed and Banks permit is necessary for the proposed works.

Based on the small amount of clearing (1.075 hectares) spread over five separate application areas, the amount of clearing of vegetation associated with watercourses is likely to be minimal. In addition, the application areas have already suffered from prior disturbance and lie immediately adjacent to a pre-existing track.

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

Methodology GIS Database
- Hydrography, linear

(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 areas have been mapped as occurring within the Boolgeeda, Newman and Table land systems (GIS Database).

Van Vreeswyk et al. (2004) reports that all of these land systems have very low erosion risk. In addition, the small amount of clearing (1.075 hectares) over an area of approximately 8.5 kilometres is unlikely to cause any appreciable land degradation.

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
- 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 may be at variance to this Principle

The Marandoo minesite is located on a reserve of 48 square kilometres held under a State Agreement Act and is surrounded by Karijini National Park (CALM, 1999). The Marandoo tenement and the associated transport corridors have been excised from the park dividing it in two (CALM, 1999).

Karijini National Park contains a representative sample of many of the geological types, plant and animal communities and landscape forms of the central portion of the Hamersley Range (CALM, 1999). In addition, the park has a high biological diversity.

The application areas fall within the corridors excised from the National Park (GIS Database). Based on the small amount of vegetation to be removed (1.075 hectares), within areas that are already disturbed, the proposed clearing is unlikely to affect the conservation values of Karijini National Park.

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

Methodology CALM (1999)
GIS Database
- DEC Managed Land and Waters

(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 areas are located in a semi-arid region where the average annual evaporation rate greatly

exceeds the annual average rainfall rate and therefore, any surface water resulting from rain events is relatively short-lived (Hamersley Iron, 2010). Furthermore, the small amount of clearing (1.075 hectares), within an already disturbed area, is unlikely to have any further impacts on surface or groundwater quality or groundwater quantity.

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

Methodology Hamersley Iron (2010)

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

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

The application areas are located in a semi-arid region where the average annual evaporation rate greatly exceeds the average annual rainfall (Hamersley Iron, 2010). There are no permanent watercourses within the application areas, however, one ephemeral drainage line crosses one of the application areas (GIS Database). Given the climate, this drainage line is expected to be dry for most of the year and would likely only flow briefly following significant rainfall.

Natural flood events do occur in the Pilbara between December and March, following cyclonic activity, however the small amount of vegetation to be cleared (1.075 hectares), is unlikely to increase the incidence or intensity of flood events.

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

Methodology Hamersley Iron (2010)
GIS Database
- Hydrography, linear

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

Comments

There is one Native Title Claim (WC97/089) over the areas under application (GIS Database). This claim has been registered with the Native Title Tribunal on behalf of the claimant group, however, the tenements have been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process. Therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

According to available databases there are numerous Aboriginal Sites of Significance (site ID's: 7980, 7983, 18430 and 18431) within the application areas (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.

One submission was received during the public comments period stating no objection to the proposed clearing.

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

4. Assessor's comments

Comment

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

Should a permit be granted, it is recommended that conditions be imposed on the permit for the purposes of weed management, record keeping and permit reporting.

5. References

- Biota (2008a) A Vegetation and Flora Survey of the Rio Tinto Rail Duplication – Bellbird Siding to Juna Downs. Unpublished Report. Biota Environmental Sciences, Western Australia.
Biota (2008b) Rio Tinto Rail Duplication Fauna Assessment: Bellbird Siding to Juna Downs. Unpublished Report. Biota

Environmental Sciences, Western Australia.

- CALM (1999) Karajini National Park Management Plan 1999 – 2009. Department of Conservation and Land Management and National Parks and Nature Conservation Authority, Western Australia.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.
- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
- Hamersley Iron (2010) Clearing Permit Application Supporting Documentation, January 2010.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Mattiske (1992) Flora and Vegetation: Marandoo Project Area. Unpublished Report. Mattiske and Associates, Western Australia.
- Shepherd, D.P. (2007) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth. Includes subsequent updates for 2006 from Vegetation Extent dataset ANZWA1050000124.
- 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.

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.
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.
DMP	Department of Mines and Petroleum, 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** **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.