



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 3344/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Hamersley Iron Pty Ltd

1.3. Property details

Property: Iron Ore (Hamersley Range) Agreement Act 1963, Mineral Lease 272SA (AML70/272)
Local Government Area: Shire of Ashburton
Colloquial name: Marandoo Mine Phase 2 Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
1.6		Mechanical Removal	Geotechnical investigations, and associated works.

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description Beard Vegetation Associations have been mapped at a 1:250,000 scale for the whole of Western Australia and are useful to look at vegetation extent in a regional context. Two Beard Vegetation Associations are located within the application area (GIS Database):

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, 2007).

Biota Environmental Sciences Pty Ltd (hereafter referred to as Biota Environmental Sciences) (2008a) undertook a vegetation and flora survey of the Marandoo Mine Phase 2 project area (which includes the application area) during March and May 2007 and April 2008. Information was collected from 35 quadrats in order to update the descriptions of map units previously described by Mattiske and Associates in 1992 and an additional eight quadrats and three relevé sites were surveyed to extend the vegetation mapping into previously unsurveyed areas (Biota Environmental Sciences, 2008a). Foot traverses of part of Marandoo Mine Phase 2 project area were conducted for the identification of additional specimens of Declared Rare Flora (DRF), Priority Flora and opportunistic species records (Biota Environmental Sciences, 2008a).

A total of 537 indigenous vascular flora from 176 genera and 60 families have been recorded from a variety of study areas in the vicinity of the Marandoo Mine Phase 2 project area (Biota Environmental Sciences, 2008a). Overall, 27 vegetation types were described from six different landforms within the Marandoo Mine Phase 2 project area; however, five vegetation types from three different landforms were located within the application area. These were:

Landform: Major Flowlines and Creeks

2c: *Eucalyptus xerothermica* – *Acacia aneura* woodland over *Acacia citrinoviridis* tall shrubland in major flowlines.

Landform: Minor Creeks

3a: *Acacia* species shrubland in minor flowlines.

Landform: Ridges and Erosional Spurs

5c: *Eucalyptus leucophloia* scattered low trees over *Acacia* spp. scattered shrubs over *Triodia* sp. Shovelanna Hill (*T. wiseana*) hummock grassland.

5d: *Eucalyptus gamophylla* scattered low mallees over *Acacia* spp. scattered tall shrubs over *Triodia* sp. Shovelanna Hill (*T. wiseana*) hummock grassland.

5h: *Triodia wiseana* hummock grassland with mixed *Acacia* spp. emergent shrubs.

Clearing Description

Hamersley Iron Pty Ltd (hereafter referred to as Hamersley Iron) (2009) have applied for a purpose permit to clear up to 1.6 hectares of native vegetation within an application area of approximately 21.6 hectares. The proposed clearing would allow the proponent to conduct geotechnical investigations within the Marandoo Mine Phase 2 project area (Hamersley Iron, 2009). The geotechnical investigations include the development of drill pads and drill holes, the establishment of access tracks and drill lines, and the maintenance of existing access tracks (Hamersley

Iron, 2009). Existing tracks will be utilised wherever possible (Hamersley Iron, 2009).

Vegetation clearing will be undertaken using mechanical means (Hamersley Iron, 2009).

Vegetation Condition Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive;
to

Pristine: No obvious signs of disturbance (Keighery, 1994).

Comment The vegetation condition rating is derived from information provided by Biota Environmental Sciences (2008a).

3. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

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

The application area is located within the Hamersley subregion of the Pilbara Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). The Hamersley subregion is characterised by Mulga low woodland over bunch grasses on fine textured soils in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (CALM, 2002).

Biota Environmental Sciences (2008a) undertook a flora and vegetation survey of 43 quadrats and three relevé sites of the Marandoo Mine Phase 2 project area (including the application area) as well as foot traverses of part of the project area for the identification of additional specimens of DRF, Priority Flora and opportunistic species records. A total of 537 indigenous vascular flora from 176 genera and 60 families were recorded within the project area, which included no DRF and six Priority Flora species (Biota Environmental Sciences, 2008a). Five vegetation types from three different landforms were identified within the application area, and the vegetation condition of all vegetation types were described as ranging from 'Excellent' to 'Pristine' condition (Biota Environmental Sciences, 2008a). Additionally, Biota Environmental Sciences (2008b) undertook a fauna survey of thirteen sites of the Marandoo Mine Phase 2 project area (including the application area). A total of 51 herpetofauna, 54 avifauna and 20 mammal (including three introduced) species could potentially be present within the application area (Biota Environmental Sciences, 2008b).

The number of flora species present within the Marandoo Mine Phase 2 project area is relatively higher than would be expected of a survey area of its size in the Pilbara; however, the flora species recorded were typical of the section of the Hamersley subregion that the application area occurs in (Biota Environmental Sciences, 2008a). Additionally, the number of fauna species recorded within the Marandoo Mine Phase 2 project area is comparatively low for the Pilbara IBRA bioregion; however, it is representative of the relatively small survey area and the consequently low degree of habitat diversity available to fauna (Biota Environmental Sciences, 2008b). Overall, it is unlikely that the application area comprises of a higher level of biological diversity than the surrounding areas.

Twenty introduced flora species were discovered within the Marandoo Mine Phase 2 project area; these were *Bidens bipinnata* (Bipinnate Beggartick), *Sigesbeckia orientalis* (Indian Weed), *Sonchus oleraceus* (Common Sowthistle), *Bassia scoparia*, *Cucumis melo* subsp. *agrestis* (Ulcardo Melon), *Euphorbia hirta* (Asthma Plant), *Euphorbia peplus* (Petty Spurge), *Malvastrum americanum* (Spiked Malvastrum), *Vachellia farnesiana* (Mimosa Bush), *Bougainvillea* sp. (Bougainvillea; planted), *Cenchrus ciliaris* (Buffel Grass), *Cenchrus setiger* (Birdwood Grass), *Chloris virgata* (Feathertop Rhodes Grass), *Cynodon dactylon* (Couch), *Echinochloa colona* (Awnless Barnyard Grass), *Setaria verticillata* (Whorled Pigeon Grass), *Acetosa vesicaria* (Ruby Dock), *Portulaca oleracea* (Purslane), *Datura leichhardtii* (Native Thornapple) and *Solanum nigrum* (Black Berry Nightshade) (Biota Environmental Sciences, 2008a). In order to minimise the spread of weed species and the risk of introducing additional weed species into the application area, it is recommended that, should the permit be granted, a condition be imposed on the permit for the purpose of weed management.

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

Methodology Biota Environmental Sciences (2008a).
Biota Environmental Sciences (2008b).
CALM (2002).
GIS Database:
- Interim Biogeographic Regionalisation for Australia.
- Interim Biogeographic Regionalisation for Australia (subregions).

(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 (2008b) conducted a fauna survey of thirteen sites of the Marandoo Mine Phase 2 project area (including the application area) during April and November 2007. A total of 51 herpetofauna, 54 avifauna and 20 mammal (including three introduced) species could potentially be present within the

application area (Biota Environmental Sciences, 2008b). This included one Schedule One-listed species and two Priority Four-listed species from the Biota Environmental Sciences (2008a) survey and an additional five Schedule-listed species and six Priority-listed species of fauna that have either been previously recorded or may occur within the Marandoo Mine Phase 2 project area.

A total of four fauna habitat types were identified within the Marandoo Mine Phase 2 project area; these included 'small drainage line', 'stony hillside', 'plain' and 'rocky gorge' fauna habitat types (Biota Environmental Sciences, 2008b). The fauna habitats within the project area were deemed to be typical of the surrounding area and are well-represented in the Pilbara IBRA bioregion (Biota Environmental Sciences, 2008b).

Biota Environmental Sciences (2008b) concluded that it appears unlikely that the proposed development of the Marandoo Mine Phase 2 project area would have adverse effects on the existing fauna and fauna habitats to the extent that it will result in alterations to the conservation status of these at a local and/or regional scale. Given that the fauna habitats are common through the Pilbara IBRA bioregion and the proposed clearing for the purposes of geotechnical investigations is relatively small (1.6 hectares), it is unlikely that the proposed clearing would disturb the whole or a part of a significant habitat for fauna indigenous to Western Australia.

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

Methodology Biota Environmental Sciences (2008b).

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Comments Proposal not likely to be at variance to this Principle

Biota Environmental Sciences (2008a) surveyed the Marandoo Mine Phase 2 project area (including the application area) and did not record the occurrence of any DRF. No records of DRF species were identified within the application area using the GIS Database. The closest location of a DRF species, *Lepidium catapycnon* (Hamersley Lepidium), is situated approximately 43 kilometres north north-west of the application area (GIS Database).

Six Priority Flora species were recorded within or adjacent to the survey area from the Biota Environmental Sciences (2008a) survey and from other surveys of the surrounding areas; these were *Goodenia lyrata* (P1), *Josephinia* sp. Marandoo (M.E. Trudgen 1554) (P1), *Indigofera ixocarpa* (P2), *Calotis latiscula* (P3), *Rhagodia* sp. Hamersley (M. Trudgen 17794) (P3) and *Eremophila magnifica* subsp. *magnifica* (P4). However, none of the Priority Flora species were located within the application area (Hamersley Iron, 2009).

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

Methodology Biota Environmental Sciences (2008a).
Hamersley Iron (2009).
GIS Database:
- Declared Rare and Priority Flora List.

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

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

There are no records of Threatened Ecological Communities (TECs) within the application area (GIS Database). The closest TEC is the *Themeda* grasslands on cracking clays (Hamersley Station) located approximately 35 kilometres north-west of the application area (GIS Database). The proposed clearing is not likely to impact on any known TEC.

There are no records of Priority Ecological Communities (PECs) within the application area (GIS Database). The closest PEC, the Coolabah-lignum flats: *Eucalyptus victrix* over *Muehlenbeckia* community, is located approximately 3.2 kilometres north-east of the application area (GIS Database). Minor, non-perennial watercourses that cover the application area drain to the north-east into an area subject to inundation in which the Coolabah-lignum flats occur (GIS Database). As such, advice was sought from the Department of Environment and Conservation's (DEC's) Karratha office and the DEC (2009) stated that the proposed clearing for the purposes of geotechnical investigations would not impact upon the PEC.

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

Methodology DEC (2009).
GIS Database:
- Hydrography, linear.
- Threatened Ecological Communities.

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments Proposal is not at variance to this Principle

The application area falls within the Pilbara IBRA bioregion in which approximately 100% of the pre-European vegetation remains (Shepherd, 2007; GIS Database).

The vegetation within the application area is classified 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, 2007; GIS Database).

As depicted within the table below, the application area does not represent a significant remnant of vegetation in an area that has been extensively cleared (Shepherd, 2007). The proposed clearing will not reduce the extent of Beard Vegetation Associations 18 and 82 below the recognised threshold level, below which species loss accelerates exponentially at an ecosystem level (EPA, 2000). Therefore, the bioregional conservation status for the Pilbara IBRA bioregion and for the Beard Vegetation Associations 18 and 82 is of 'Least Concern' (Department of Natural Resources and Environment, 2002).

While a relatively small percentage of the vegetation types within the Pilbara IBRA bioregion are protected within conservation reserves, the IBRA bioregion remains largely uncleared. The proposed clearing is unlikely to impact on the conservation status for Beard Vegetation Associations 18 and 82 within the Pilbara IBRA bioregion.

	Pre-European area (hectares)*	Current extent (hectares)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion – Pilbara	17,804,188	17,794,647	~99.95	Least Concern	~6.32
Beard veg assoc. – State					
18	19,892,305	19,890,195	~100	Least Concern	~2.1
82	2,565,901	2,565,901	~100	Least Concern	~10.2
Beard veg assoc. – Bioregion					
18	676,557	676,557	~100	Least Concern	~16.8
82	2,563,583	2,563,583	~100	Least Concern	~10.2

* 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).
EPA (2000).
Shepherd (2007).
GIS Database:
- Interim Biogeographic Regionalisation of Australia.
- Pre-European Vegetation.

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

Comments Proposal is at variance to this Principle

No permanent wetlands and watercourses occur within the application area (GIS Database). The application area contains numerous minor, non-perennial watercourses which flow in a north-easterly direction in to an area subject to inundation (located outside of the application area) (GIS Database).

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

The proposed clearing is for geotechnical investigations so only a relatively small amount of clearing is proposed (i.e., 1.6 hectares within a 21.6 hectare area). The impact of the clearing within the application area will be minimal and is unlikely to result in a significant impact to the vegetation types growing in, or in association with, the watercourses.

Methodology Biota Environmental Sciences (2008a).
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**

Land system mapping by the Department of Agriculture and Food Western Australia has mapped a variety of rangeland land systems for the Pilbara IBRA bioregion. Land systems are mapped based on biophysical features such as soil and landform type, geology, geomorphology and vegetation type (Van Vreeswyk et al., 2004). The application area includes two land systems (GIS Database). A broad description of each land system is given below:

Boolgeeda:

The Boolgeeda land system is characterised by stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and mulga shrublands (Van Vreeswyk et al., 2004). Relief is up to 20 metres (Van Vreeswyk et al., 2004). The Boolgeeda land system is generally not prone to erosion (Van Vreeswyk et al., 2004). Approximately 60% of the application area has been mapped as the Boolgeeda land system (GIS Database).

Newman:

The Newman land system is characterised by rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands (Van Vreeswyk et al., 2004). Relief is up to 450 metres (Van Vreeswyk et al., 2004). The Newman land system is generally not prone to erosion (Van Vreeswyk et al., 2004). Approximately 40% of the application area has been mapped as the Newman land system (GIS Database).

The applied area for clearing associated with the Marandoo Mine Phase 2 Project is relatively small given the clearing activity is geotechnical investigations.

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

Methodology Van Vreeskyk et al. (2004).
GIS Database:
- Rangeland land system mapping.

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

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

The application area is located within an excised portion of the Karijini National Park (GIS Database). The boundary of the Karijini National Park is approximately 0.9 kilometres south of the application area; however, the application area is almost completely surrounded by the national park (GIS Database). Additionally, an infrastructure corridor which is listed as a conservation area occurs approximately 0.5 kilometres north of the application area (GIS Database).

Given the distance separating the application area from the national park and infrastructure corridor, the DEC's Karratha office was consulted regarding whether the proposed clearing was likely to have an impact on the environmental values of the adjacent conservation areas. The DEC (2009) stated that as it was to be undertaken within an area excised from the Karijini National Park and the infrastructure corridor, the proposed clearing for the purposes of geotechnical investigations would not impact upon the environmental values of the adjacent conservation areas.

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

Methodology DEC (2009).
GIS Database:
- DEC Tenure.

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

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

The application area is not located within any proclaimed, gazetted or declared management areas or catchments (GIS Database). There are no named watercourses within the application area; however, the area contains a number of minor non-perennial watercourses which flow in a north-eastern direction into an area subject to inundation (GIS Database).

Rainfall in the Pilbara tends to be unpredictable and erratic, and the rocky-sloping topography of much of the upper catchments often produces considerable runoff (Van Vreeswyk et al., 2004). As such, the non-perennial watercourses tend to have high levels of sedimentation and turbidity after rainfall events (Van Vreeswyk et al., 2004). As such, the minimal amount of clearing associated with geotechnical investigations is unlikely to

increase the sediment load of the surface water significantly compared to surrounding uncleared areas.

The application area is not located within a Public Drinking Water Source Area (GIS Database). Therefore, the clearing associated with geotechnical investigations is unlikely to have an adverse effect on groundwater quality.

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

Methodology Van Vreeswyk et al. (2004).
GIS Database:
- Hydrography, linear.
- Public Drinking Water Source Areas (PDWSAs).

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

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

The application area receives approximately 350 millimetres of rainfall per annum and has an average evaporation rate of approximately 3,400 millimetres per annum (GIS Database). The minor watercourses within the application area are non-perennial in nature and only flow as a result of heavy rainfall (GIS Database). The applied area for clearing associated with the Marandoo Mine Phase 2 Project is relatively small given the clearing activity is for geotechnical investigations. As such, it is unlikely that the proposed clearing will cause or exacerbate the incident or intensity of flooding.

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

Methodology GIS Database:
- Evaporation Isopleths (Evaporation).
- Hydrography, linear.
- Isohyets (Rainfall).

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

Comments There is one native title claim over the area under application; WC97_089 (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mineral lease 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 is one known Aboriginal Site of Significance within the application area (on the permanent register) and four known Aboriginal Sites of Significance are located within 2 kilometres of the application area (two sites on the permanent register and two sites on the interim register) (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.

The Marandoo Mine Phase 2 Project has been referred to the Environmental Protection Authority (EPA) and is currently under formal assessment. Hamersley Iron requested advice from the EPA to determine whether the proposed works fell under the proposal under assessment. The EPA determined that the proposed geotechnical investigations subject to this clearing permit application are minor and preliminary works and therefore acceptable under s. 41A(3) of the *Environmental Protection Act 1986*, and can be carried out prior to the completion of the EPA assessment (EPA, 2009).

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 by the Department of Mines and Petroleum for this application, however there were no objections raised with regard 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 the proposed clearing is at variance to Principle (f), is not likely to be at variance to Principles (a), (b), (c), (d), (g), (h), (i) and (j) and is not at variance to Principle (e).

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

5. References

- Biota Environmental Sciences (2008a) Marandoo Mine Phase 2 Project Vegetation and Flora Survey. Biota Environmental Sciences Pty Ltd, Western Australia.
- Biota Environmental Sciences (2008b) Marandoo Mine Phase 2 Seasonal Fauna Survey. Biota Environmental Sciences Pty Ltd, Western Australia.
- CALM (2002) A biodiversity audit of Western Australia's 53 biogeographical subregions in 2002. Department of Conservation and Land Management, Western Australia.
- DEC (2009) Advice to the assessing officer, received on 28 October 2009, Department of Environment and Conservation.
- 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.
- EPA (2000) Environmental protection of native vegetation in Western Australia. Clearing of native vegetation, with particular reference to the agricultural area. Position Statement No. 2. December 2000. Environmental Protection Authority, Western Australia.
- EPA (2009) Advice to Hamersley Iron Pty Ltd, sent on 22 September 2009, Environmental Protection Authority.
- Hamersley Iron (2009) Marandoo Mine Phase 2. Application for a clearing permit (purpose permit): Form C2. 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.
- 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., Payne, A.L., Leighton, K.A. & Hennig, P. (2004) Technical bulletin no. 92: An inventory and condition survey of the Pilbara region, Western Australia. Department of Agriculture, South Perth, Western Australia.

6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
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	<i>Environment Protection Act 1986</i> , Western Australia.
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (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	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia.
s.17	Section 17 of the <i>Environment Protection Act 1986</i> , 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.