



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 3475/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Hamersley Iron Pty Ltd

1.3. Property details

Property: Iron Ore (Rhodes Ridge) Authorisation Agreement Act 1972
Temporary Reserves 70/4266 and 70/4737

Local Government Area: Shire of East Pilbara

Colloquial name: Hope Downs 4 Rail Spur Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
12.6		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
<p>Beard Vegetation Associations have been mapped at a 1:250,000 scale for the whole of Western Australia. Three Beard Vegetation Associations have been mapped within the application area (GIS Database):</p> <p>18: Low Woodland; mulga (<i>Acacia aneura</i>);</p> <p>29: Sparse low woodland; mulga, discontinuous in scattered groups;</p> <p>82: Hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i>.</p> <p>Rio Tinto (2009) conducted a vegetation survey over the application area and surrounding vegetation during April 2008. Seven vegetation types have been identified within the application area (Rio Tinto, 2009). These are:</p> <p>1) <i>Eucalyptus leucophloia</i>, <i>Codonocarpus cotinifolius</i>, <i>Acacia aneura</i>, <i>A. pruinosa</i> low open forest over <i>Eremophila fraseri</i>, <i>E. forrestii</i>, <i>Senna glutinosa</i> subsp. <i>X luerssenii</i> open heath over <i>Ptilotus obovatus</i> low open shrubland over <i>Triodia basedowii</i> hummock grassland over <i>Aristida holathera</i>, <i>A. contorta</i> very open bunch grassland;</p> <p>2) <i>Eucalyptus socialis</i> low open forest over <i>Ptilotus obovatus</i> low open shrubland over <i>Triodia longiceps</i>, <i>T. wiseana</i> hummock grassland over <i>Paraneurachne muelleri</i>, <i>Enneapogon caerulescens</i> very open bunch grassland;</p> <p>3) <i>Acacia aneura</i> var. <i>aneura</i>, <i>A. pruinocarpa</i> low open forest over <i>Acacia ancistrocarpa</i>, <i>A. pachyacra</i>, <i>A. maitlandii</i> high open shrubland over <i>Keraudrenia integrifolia</i> low open shrubland over <i>Triodia pungens</i>, <i>T. wiseana</i> hummock grassland;</p> <p>4) <i>Acacia aneura</i>, <i>A. ayersiana</i> low open forest over <i>Mairena villosa</i> low scattered shrubs over <i>Enneapogon</i></p>	<p>Hamersley Iron is proposing to clear up to 12.6 hectares of native vegetation within a boundary of 333.4 hectares (Rio Tinto, 2010). The application area is located approximately 50 kilometres north-west of Newman (GIS Database). The proposed clearing is for the purpose of mineral exploration which will involve the implementation of access tracks and sterilisation drilling (Rio Tinto, 2009).</p> <p>Clearing will be done using the raised blade technique where practicable or scrub rake level terrain. Where already cleared tracks require maintenance, the track may be graded using blade down (Rio Tinto, 2009).</p>	<p>Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).</p>	<p>The vegetation descriptions were derived from descriptions by Rio Tinto (2009).</p>

polyphyllus, *Aristida obscura* very open bunch grassland;

5) *Corymbia candida* subsp. *dipsodes* open woodland over *Acacia aneura*, *Corymbia hamersleyana*, *Eucalyptus xerothermica* low woodland over *Chrysopogon fallax*, *Themeda triandra* very open tussock grassland over *Eulalia aurea* and various bunch grasses over *Dipteracanthus australasicus* subsp. *corynothecus* very open herbs;

6) *Acacia aneura*, *Corymbia hamersleyana* low open forest over *Eremophila longifolia* open shrubland over *Chrysopogon fallax*, *Themeda triandra* tussock grassland over *Eulalia aurea*, *Enneapogon lindleyanus* open bunch grassland over *Ptilotus astrolasius* very open herbs;

7) *Acacia aneura* var. *aneura*, *A. pruinocarpa* low woodland over *Petalostylis labicheoides*, *Acacia bivenosa* high shrubland over *Triodia longiceps* open hummock grassland over *Chrysopogon fallax*, *Themeda triandra* very open tussock grassland over *Eulalia aurea*, *Enneapogon lindleyanus* open bunch grassland.

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 Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). This subregion generally consists of mountainous areas of Proterozoic sedimentary ranges and plateaux, dissected by gorges (basalt, shale and dolerite) (Kendrick, 2001). The Hamersley subregion generally contains 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 (Kendrick, 2001).

The vegetation within the application area consists of Beard Vegetation Associations 18, 29 and 82, which are both common and widespread throughout the Pilbara region, with approximately 100% of each of these pre-European vegetation types remaining (GIS Database; Shepherd, 2007).

Rio Tinto have identified and described seven vegetation types for the application area and recorded a total of 183 flora species, from 80 genera belonging to 33 families (Rio Tinto, 2009). The total number of flora species recorded for the application area is within the expected range for an area of this size in the locality, and is not considered to represent high species richness (Rio Tinto, 2009). The condition of the vegetation within the application area was deemed to be Very Good on the Keighery scale (1994) due to the lack of disturbance within the application area.

No Declared Rare Flora, Threatened Ecological Communities or Threatened Fauna Species were noted across the application area (GIS Database; Rio Tinto, 2009). Four records of *Lepidium catapycnon* are located approximately two kilometres south of the application area (GIS Database). The former Priority 3 flora species *Goodenia pascua* was recorded from two locations within the survey area (Rio Tinto, 2009). This species has recently been delisted from the Priority Flora list and is not currently protected as a priority species by the Department of Environment and Conservation (Florabase, 2010; Rio Tinto, 2009).

Five introduced flora species have been identified within the application area: *Malvastrum americanum* (Spiked Malvastrum); *Setaria verticillata* (Whorled Pigeon Grass); *Biden bipinnata* (Beggartick); *Cucumis melo* (Ulcardo Melon); and *Portulaca oleracea* (Pigweed) (Rio Tinto, 2009). Care must be taken to ensure that the proposed clearing activities do not spread or introduce the above listed introduced species to non infested areas. Should the permit be granted, it is recommended that the appropriate conditions be imposed on the permit for the purpose of weed management.

From a fauna perspective, no detailed surveys have been undertaken to measure the species richness of the application area; however, opportunistic sightings of fauna were recorded and a fauna survey for the Hope Downs 4 project application was used as a guide (Rio Tinto, 2009). The Priority 4 fauna species *Ardeotis australis* (Australian Bustard) was recorded from one sight on the northern boundary of the application area (Rio Tinto, 2009). It is acknowledged that the Pilbara bioregion is known to support a diversity of arid zone reptiles. However, based on assessment of fauna habitat it is not likely that the area applied to clear would support a higher level of fauna species diversity than any other area in the local area or region (GIS Database; Rio Tinto, 2009).

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

Methodology Florabase (2010)
Kendrick (2001)
Rio Tinto (2009)
Shepherd (2007)
GIS Database:
-Declared Rare and Priority Flora
-IBRA WA (Regions - Sub Regions)
-Ophthalmia 50cm Orthomosaic
-Pre European Vegetation

(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**

According to available datasets, there are no known records of threatened fauna within the application area (GIS Database). No detailed fauna survey was undertaken to measure the species richness of the application area; however opportunistic sightings of fauna were recorded and a previous fauna survey conducted by Ninox Wildlife Consulting for the Hope Downs 4 project application was used as a guide (Rio Tinto, 2009).

Ninox Wildlife Consulting (2008) identified four habitat types during their survey of the Hope Downs 4 application area. Based on aerial photography, and descriptions by both Rio Tinto (2009) and Ninox Wildlife Consulting (2008) it appears that one of these habitat types occurs within the application area:

- Low Open Woodland of *Acacia aneura* var. *aneura*, *Acacia pruinocarpa* over *Acacia tetragonophylla*, *Eremophila forrestii* subsp. *forrestii* over *Triodia pungens* and a range of annual species on open sandy-loam flats and broad plains.

Based on the results of opportunistic sightings in the field, the Ninox Wildlife Consulting (2008) fauna survey, and a search of the Western Australian Museum's (2010) online fauna database, two priority fauna species have been identified as potentially occurring within the application area:

P4 - Department of Environment and Conservation Priority Fauna List: *Ardeotis australis* (Australian Bustard) and *Pseudomys chapmani* (Western Pebble-mound Mouse).

One opportunistic sighting was recorded of *Ardeotis australis* (Australian Bustard). The Australian Bustard is a dispersive species with widespread movements over long distances (Rio Tinto, 2009). The Australian Bustard is known to inhabit grasslands, low shrublands, grassy woodlands as well as altered environments such as croplands and airfields (AWC, 2010). Suitable habitat for this species is present within the application area, however, based on the widespread distribution of this species it is unlikely that the vegetation within the application areas represents significant habitat for this species.

Populations of the Western Pebble-mound Mouse are widespread in the extensive ranges of the central and southern Pilbara, extending into the smaller ranges of the Little Sandy Desert (Van Dyck and Strahan, 2008). The Western Pebble-mound Mouse generally occurs on gentler slopes of rocky ranges where the ground is covered by a stony mulch and vegetated by hard spinifex, often with an overstorey of eucalypts and scattered shrubs (Van Dyck and Strahan, 2008). Mounds are often sited close to narrow ribbons of *Acacia*-dominated scrub that grows along incised drainage lines (Van Dyck and Strahan, 2008). Suitable habitat for this species is present within the application areas, however, this species has a widespread distribution and therefore, it is unlikely that the vegetation within the application areas represents significant habitat for this species. Hamersley Iron should make all contractors aware that Western Pebble-mound Mouse mounds may be present in rocky places within the application areas and that these should be avoided wherever possible.

The habitat types present within the application area are well represented on a local and regional scale (Ninox Wildlife Consulting, 2008). Therefore, the vegetation of the application area is unlikely to represent significant habitat for any fauna species. Furthermore, the small nature of the proposed clearing is unlikely to result in a significant impact to any fauna species.

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

Methodology AWC (2010)
Ninox Wildlife Consulting (2008)
Rio Tinto (2009)
Van Dyck and Strahan (2008)
Western Australian Museum (2010)
GIS Database:
-Threatened Fauna

(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

According to available datasets, there are no known records of Declared Rare Flora (DRF) or Priority Flora species within the application area (GIS Database). The nearest recorded location of DRF (*Lepidium catapycnon*) occurs approximately 2 kilometres south of the application area (GIS Database).

A Declared Rare and Priority Flora survey was undertaken by a Rio Tinto botanist during April 2008 (Rio Tinto, 2009). No species of DRF, Priority Flora or Environmental Protection and Biodiversity Conservation (EPBC) Act, 1999 listed threatened flora were recorded within the application area (Rio Tinto, 2009). A former Priority 3 flora species (*Goodenia pascua*) was recorded from two locations within the application area (Rio Tinto, 2009). *Goodenia pascua* has recently been delisted from the priority flora list, and is no longer protected as a priority species by the Department of Environment and Conservation (Rio Tinto, 2009).

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

Methodology Rio Tinto (2009)
GIS Database:
-Declared Rare and Priority Flora

(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 Threatened Ecological Communities (TEC's) within the application area (GIS Database). The closest TEC is located approximately 18 kilometres north-west of the application area (GIS Database).

Rio Tinto (2009) reports that no TEC's were identified within the Hope Downs survey area during the botanical survey.

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

Methodology Rio Tinto (2009)
GIS Database:
-DEC Tenure
-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 is located within the Pilbara Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Shepherd (2007) report that approximately 99.95% of the pre-European vegetation still exists in the Pilbara Bioregion. The vegetation in the application area is broadly mapped as Beard Vegetation Associations 18: Low woodland; mulga (*Acacia aneura*); 29: Sparse low woodland; mulga, discontinuous in scattered groups; and 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (GIS Database; Kendrick, 2001). According to Shepherd (2007) there is approximately 100% of these vegetation types remaining in the Pilbara Bioregion and the State (see table below).

According to the Bioregional Conservation Status of Ecological Vegetation Classes the conservation status for Beard Vegetation Associations 18, 29 and 82, within the Pilbara Bioregion is of 'Least Concern' (Department of Natural Resources and Environment, 2002).

Although several large scale mining operations are located within a 50 kilometre radius of the application area, the Pilbara Bioregion remains largely uncleared (GIS Database). As a result the conservation of the vegetation associations within the bioregion is not likely to be impacted upon by the proposal.

	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	~99.95	Least Concern	6.32
Beard veg assoc. – State					
18	19,892,305	19,890,195	~100	Least Concern	2.1
29	7,903,991	7,903,991	~100	Least Concern	0.3
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
29	1,133,219	1,133,219	~100	Least Concern	1.9
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)
Kendrick (2001)
Shepherd (2007)
GIS Database:
-IBRA WA (Regions - Subregions)
-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

According to available GIS Databases there are no permanent wetlands or watercourses within the application area, however, two ephemeral drainage lines are present (GIS Database). Rio Tinto has reported three vegetation units within the application area that are generally associated with watercourses:

Floodplain

1) *Corymbia candida* subsp *dipsodes* open woodland over *Acacia aneura*, *Corymbia hamersleyana*, *Eucalyptus xerothermica* low woodland over *Chrysopogon fallax*, *Themeda triandra* very open tussock grassland over *Eulalia aurea* and various bunch grasses over *Dipteracanthus australasicus* subsp. *corynothecus* very open herbs;

2) *Acacia aneura*, *Corymbia hamersleyana* low open forest over *Eremophila longifolia* open shrubland over *Chrysopogon fallax*, *Themeda triandra* tussock grassland over *Eulalia aurea*, *Enneapogon lindleyanus* open bunch grassland over *Ptilotus astrolasius* very open herbs;

Ephemeral Drainage Line

3) *Acacia aneura* var. *aneura*, *A. pruinocarpa* low woodland over *Petalostylis labicheoides*, *Acacia bivenosa* high shrubland over *Triodia longiceps* open hummock grassland over *Chrysopogon fallax*, *Themeda triandra* very open tussock grassland over *Eulalia aurea*, *Enneapogon lindleyanus* open bunch grassland.

Each of these vegetation units are reported by Rio Tinto (2009) as being in a very good condition, however, these vegetation units are well represented within the Karijini National Park, approximately 65 kilometres west. The relatively small scale clearing of 12.6 hectares spread out within an area of 333.4 hectares is also unlikely to have any significant impacts upon vegetation associated with watercourses or wetlands.

Based on the above, the proposed clearing is at variance to this Principle, however, the vegetation units associated with watercourses are well represented locally, and within the Pilbara region generally. Consequently, the proposed clearing is unlikely to have any significant impacts on watercourses at a regional scale given their widespread distribution.

Methodology Rio Tinto (2009)
GIS Database:

(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

According to the Department of Agriculture's Technical Bulletin No. 92 "An inventory and condition survey of the rangelands of the Pilbara region, Western Australia", the application area is comprised of the Newman Land System and the Spearhole Land System (GIS Database; Van Vreeswyk et al., 2004).

The Newman Land System consists of rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands which typify much of the Pilbara (Van Vreeswyk et al., 2004). An analysis of aerial photography for the application area reveals it is most likely to contain the landform units: 'Narrow drainage floors with channels' and 'Stony plains' (GIS Database; Van Vreeswyk et al., 2004). Approximately 99% of the Newman Land System is not affected by soil erosion, with the landform units present within the application area not being considered part of the erosional surfaces (Van Vreeswyk et al., 2004).

The Spearhole Land System consists of gently undulating hardpan plains supporting groved mulga shrublands and hard spinifex (Van Vreeswyk et al., 2004). An analysis of aerial photography for the application area reveals it is most likely to contain the: 'Drainage zones and channels' landform unit; 'Dissected slopes' landform unit; 'Gravelly hardpan plains' landform unit; and 'Low rises' landform unit. The Spearhole Land System is not susceptible to erosion (Van Vreeswyk et al., 2004).

The proposed purpose of the application area is for sterilisation drilling for the Hope Downs 4 rail spur (Rio Tinto, 2009). While there is no current extensive land clearance surrounding the current survey area, it is not likely this drilling program will cause appreciable land degradation and will not result in acidification or salinisation of land within or surrounding the application area (Rio Tinto, 2009).

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

Methodology Rio Tinto (2009)
Van Vreeswyk et al. (2004)
GIS Database:
-Ophthalmia 50 cm Orthomosaic
-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 not situated within a Department of Environment and Conservation managed conservation area (GIS Database). The nearest conservation estate is Karijini National Park, which is situated approximately 65 kilometres west of the application area (GIS Database). Based on the distance between the proposal and the nearest conservation area, the proposed clearing is not likely to impact on the conservation value of Karijini National Park.

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

Methodology GIS Database:
-DEC Tenure

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

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

The application area is located in an arid region with an annual average rainfall of approximately 310 millimetres falling mainly during the summer months (BoM, 2010). Based on an average annual evaporation rate of approximately 3,600 millimetres, any surface water resulting from rain events is expected to be relatively short-lived (GIS Database; ANRA, 2007).

Two ephemeral drainage lines are present within the application area, one traversing north along the western boundary, and the other being the end of a drainage line entering on the eastern boundary (GIS Database). Based on the climate of the region these creeks are expected to be dry except following significant rainfall events which are typically associated with tropical cyclones (ANRA, 2007). Therefore, the proposed clearing is unlikely to have a significant impact upon surface water quality in the area.

The proposed clearing is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The Pilbara region consists of granite - greenstone bedrock in the north, and the sedimentary and volcanic rocks of the Hamersley basin in the south (DoF, 2004). The application area is located within the south of the Pilbara region and would therefore, most likely be located in the Hamersley basin. In this basin, large amounts

of groundwater are used for mining related purposes, principally from calcrete and pisolite valley fill aquifers (DoF, 2004). Groundwater is generally fresh or brackish (DoF, 2004). The clearing of 12.6 hectares within a 333.4 hectare area is not likely to have a significant impact upon surface or groundwater quality, or groundwater quantity (Rio Tinto, 2009).

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

Methodology ANRA (2007)
BoM (2010)
DoF (2004)
Rio Tinto (2009)
GIS Database:
-Evaporation Isopleths
-Hydrography, Linear
-Public Drinking Water Source Area (PDWSA)

(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 is located in an arid region where the average annual evaporation rate greatly exceeds the average annual rainfall (BoM, 2010). There are no permanent watercourses within the application area, however two ephemeral drainage lines traverse the application area (GIS Database). These drainage lines are expected to be dry for most of the year, and would likely only flow immediately following significant rainfall.

Natural flood events do occur in the Pilbara region following cyclonic activity. However, the proposed clearing is not expected to increase the incidence or intensity of such events given the size of the area to be cleared (12.6 hectares), in relation to the Fortescue River Upper catchment area (2,975,192 hectares) (GIS Database).

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

Methodology BoM (2010)
GIS Database:
-Hydrography, Linear
-Hydrographic Catchments - Catchments

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

Comments

There is one Native Title Claim (WC99/004) over the area under application (GIS Database). This claim has been registered with the National 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 no known Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Environment and Conservation and the Department of Water to determine whether a works approval, Water Licence, Bed and Banks permit or any other licences or approvals are required for the proposed works.

There were no public submissions received during the public comments period.

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

4. Assessor's comments

Comment

The proposed clearing 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 a clearing permit be granted, it is recommended that conditions be imposed on the permit for the purposes of weed management, retention of topsoil and vegetative material, record keeping and permit reporting.

5. References

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- Van Dyck, S. and Strahan, R. (eds.) (2008) The Mammals of Australia. Third Edition. New Holland Publisher (Australia) Pty Ltd, Australia.
- Van Vreeswyk, A.M.E., Payne, A.L., Leighton, K.A., and Hennig, P. (2004) Technical Bulletin: An inventory and condition survey of rangelands in Pilbara Region, Western Australia, No 92. Department of Agriculture, Western Australia.
- Western Australian Museum (2010) NatureMap - Mapping Western Australia's Biodiversity - Department of Environment and Conservation. Available online from: <http://naturemap.dec.wa.gov.au/default.aspx> Last accessed 12 February 2010.

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.
- 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.