



1. Application details

1.1. Permit application details

Permit application No.: 4875/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: BHP Billiton Iron Ore Pty Ltd

1.3. Property details

Property: Iron Ore (Mount Newman) Agreement Act 1972, Mineral Lease 244SA (AML 70/244)
Local Government Area: Shire of East Pilbara
Colloquial name: Wheelarra Hill North Drilling Program

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
90		Mechanical Removal	State Agreement

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 10 May 2012

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 for the whole of Western Australia and are useful to look at vegetation in a regional context. Two Beard vegetation associations have been mapped within the application area (GIS Database):

82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*; and

216: Low woodland; mulga (with spinifex) on rises.

A Level 2 flora survey was conducted over the application area in May and October 2011 by Syrinx Environmental Pty Ltd (Syrinx). There were 23 vegetation associations recorded within the application area (Syrinx, 2012):

Acacia Low Woodland

2a: Low Woodland of *Acacia aptaneura*, *Acacia ? pteraneura* and *Acacia pruinocarpa* over Open Hummock Grassland of *Triodia epactia* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Shrubland of *Acacia wanyu*, *Acacia tetragonophylla* and *Senna stricta*;

2c: Low Woodland of *Acacia aptaneura* and *Corymbia hamersleyana* over Very Open Shrubland of *Acacia wanyu*, *Acacia ancistrocarpa* and *Eremophila forrestii* subsp. (indet) over Very Open Hummock Grassland of *Triodia epactia* and *Triodia lanigera*;

2d: Low Woodland of *Acacia ? aptaneura*, *Acacia mulganeura* and *Ficus brachypoda* over High Open Shrubland of *Acacia monticola*, *Grevillea wickhamii* subsp. (indet) and *Acacia wanyu* over Very Open Tussock Grassland of *Eragrostis cumingii*, *Amphipogon sericeus* and *Themeda triandra*;

Acacia Low Open Woodland

3a: Low Open Woodland of *Acacia aptaneura* and *Acacia pruinocarpa* over High Open Shrubland of *Acacia tetragonophylla* and *Acacia synchronicia* over Very Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835);

Acacia High Shrubland

4a: High Shrubland of *Acacia monticola*, *Rulingia luteiflora* and *Gossypium robinsonii* with Low Woodland of *Corymbia hamersleyana*, *Eucalyptus victrix* and *Eucalyptus leucophloia* subsp. *leucophloia* over Very Open Tussock Grassland of *Themeda triandra*, *Cenchrus ciliaris* and *Cymbopogon procerus*;

4b: High Shrubland of *Acacia monticola*, *Acacia hamersleyensis* and *Petalostylis labicheoides* over Open Hummock Grassland of *Triodia melvillei*, *Triodia epactia* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Corymbia ferricola* and *Ficus brachypoda*;

Triodia Hummock Grassland

5a: Hummock Grassland of *Triodia brizoides*, *Triodia epactia* and *Triodia angusta* with Open Shrubland of *Acacia tetragonophylla* and *Acacia synchronicia* with Very Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Acacia ? pteraneura* (hybrid?);

5b: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia epactia* and *Triodia brizoides* with Low Open Woodland of *Acacia aptaneura*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Acacia pruinocarpa* over Open Shrubland of *Acacia tetragonophylla*, *Dodonaea pachyneura* and *Eremophila exilifolia*;

5c: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Shrubland of *Acacia hilliana*, *Acacia adoxa* var. *adoxo* and *Halgania solanacea* var. Mt Doreen (G.M. Chippendale 4206) with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* and *Acacia pruinocarpa*;

5d: Hummock Grassland of *Triodia lanigera* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Open Shrubland of *Hakea lorea* subsp. *lorea*, *Acacia ancistrocarpa* and *Acacia adsurgens* with Scattered Low Trees of *Corymbia hamersleyana* and *Acacia pruinocarpa*;

5e: Hummock Grassland of *Triodia brizoides*, *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia epactia* with Open Shrubland of *Acacia tetragonophylla*, *Eremophila fraseri* subsp. *fraseri* and *Senna glutinosa* subsp. *Pruinosa*;

5g: Hummock Grassland of *Triodia lanigera* and *Triodia epactia* with High Open Shrubland of *Acacia bivenosa*, *Acacia ancistrocarpa* and *Acacia tenuissima* with Very Open Mallee of *Eucalyptus gamophylla*;

5h: Hummock Grassland of *Triodia epactia*, *Triodia brizoides* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), with Low Open Woodland of *Acacia aptaneura*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Acacia pruinocarpa* over Scattered Shrubs of *Acacia tetragonophylla*, *Scaevola acacioides* and *Acacia wanyu*;

5i: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia epactia* and *Triodia brizoides* with High Open Shrubland of *Acacia bivenosa* and *Acacia tetragonophylla* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* and *Acacia aptaneura*;

5j: Hummock Grassland of *Triodia brizoides* with Open Shrubland of *Acacia wanyu*, *Scaevola acacioides* and *Acacia tetragonophylla* with Low Open Woodland of *Acacia ? pteraneura* (hybrid?) and *Acacia pruinocarpa*;

Triodia Open Hummock Grassland

6a: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Shrubland of *Halgania solanacea* var. Mt Doreen (G.M. Chippendale 4206), *Gompholobium* sp. Pilbara (N.F. Norris 908) and *Acacia adoxa* var. *adoxo*;

6c: Open Hummock Grassland of *Triodia epactia* and *Triodia angusta* with Scattered Mallees of *Eucalyptus socialis* subsp. *eucentrica* over Scattered Shrubs of *Acacia bivenosa*;

6d: Open Hummock Grassland of *Triodia epactia* with High Shrubland of *Acacia citrinoviridis*, *Acacia ancistrocarpa* and *Acacia pyriformis* with Low Open Woodland of *Corymbia hamersleyana*;

6e: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia epactia* and *Triodia brizoides* with Low Open Woodland of *Acacia aptaneura*, *Acacia ? pteraneura* (hybrid?) and *Acacia rhodophloia* over Open Shrubland of *Acacia tetragonophylla*, *Acacia adsurgens* and *Senna glutinosa* subsp. *glutinosa*;

6f: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia epactia* with Low Open Shrubland of *Acacia hilliana*, *Sida* sp. *excedentifolia* (J.L. Egan 1925) and *Senna glutinosa* subsp. *pruinosa* with Scattered Trees of *Eucalyptus leucophloia* subsp. *leucophloia*;

6g: Open Hummock Grassland of *Triodia brizoides* and *Triodia epactia* with Low Open Shrubland of *Eremophila fraseri* subsp. *fraseri*, *Senna artemisioides* subsp. *oligophylla* and *Senna artemisioides* subsp. *helmsii*;

Triodia Very Open Hummock Grassland

7a: Very Open Hummock Grassland of *Triodia lanigera* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Scattered Shrubs of *Grevillea wickhamii* subsp. (indet), *Acacia ancistrocarpa* and *Hakea lorea* subsp. *lorea* with Scattered Trees of *Corymbia hamersleyana*;

Mixed Open Tussock Grassland

8a: Open Tussock Grassland of *Themeda triandra*, *Aristida inaequiglumis* and *Aristida contorta* with Open Shrubland of *Acacia monticola*, *Acacia ancistrocarpa* and *Grevillea wickhamii* subsp. *aprica* with Scattered Low Trees of *Corymbia hamersleyana*.

Clearing Description

BHP Billiton Iron Ore Pty Ltd (BHPBIO) has applied to clear up to 90 hectares of native vegetation within an application area of approximately 2,034 hectares for the purposes of mineral exploration, hydrological and geotechnical investigations and associated activities (GIS Database).

Vegetation Condition

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

to

Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994).

Comment

The vegetation condition was assessed by botanists from Syrinx (2012).

Part of the application area was burnt in 2007 which resulted in altered species dominance and composition to some extent in the affected areas (Syrinx, 2012).

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 flora and vegetation survey of the larger Whellarra Hill North area identified 23 different vegetation associations within the application area (Syrinx, 2012). The majority of the application area was in 'very good' to 'excellent' condition (Syrinx, 2012). In comparison to previous surveys in adjacent areas the vegetation associations recorded are considered to be similar and widespread throughout the south-east Pilbara (Syrinx, 2012). None of the vegetation associations recorded were identified as a Threatened or Priority Ecological Community (Syrinx, 2012).

The flora survey over the larger Wheelarra Hill North area recorded 392 taxa from 49 families and 145 genera (Syrinx, 2012). The application area lies within a transition area of the Hamersley and Fortescue subregions and the floristic diversity is typical of a transitional environment (Syrinx, 2012). There was one species recorded that may potentially be the Priority 1 flora species *Aristida jerichoensis* var *subspinulifera*, however, this cannot be fully confirmed due to the poor description of variation within the species (Syrinx, 2012). There were nine flora species identified as being a range extension (Syrinx, 2012). The large number of range extensions is possibly due to the varied habitats present within the application area (Syrinx, 2012). Of these species, four appear to be regionally significant, however, only three of these were recorded within the application area (Syrinx, 2012). The nearest record of the species *Oldenlandia galioides* is located approximately 280 kilometres north-west of the application area near Tom Price (Syrinx, 2012). *Eragrostis olida* has been previously recorded 55 kilometres north-west of the application area, however, that record is the only other record of this species within the Pilbara region (Syrinx, 2012). There was one record of the species *Hibiscus* aff. *apodus*, however, this specimen was not sufficient to confirm the species fully (Syrinx, 2012). If this identification is correct it represents a significant range extension as this species has only been previously found in the Kimberley region (Syrinx, 2012). Potential impacts to these species and *Aristida jerichoensis* var *subspinulifera* may be minimised by the successful implementation of a flora management condition. There were three species of introduced flora recorded within the application area; Buffel Grass (*Cenchrus ciliaris*), Bipinnate Beggartick (*Bidens bipinnata*) and Purslane (*Portulaca oleracea*) (Syrinx, 2012). The potential impacts on biodiversity as a result of the proposed clearing may be minimised by the successful implementation of a weed management condition.

The fauna survey of the greater Whelarra Hill North area recorded a total of 139 vertebrate fauna species including two amphibian, 55 reptile, 59 bird and 23 mammal species (ENV, 2012). The totals of reptile and bird species recorded are within the frequency commonly recorded within the Pilbara during Level 2 surveys suggesting that the overall species richness recorded during the survey is typical of the region (ENV, 2012). The habitats present are widespread through the Pilbara region (ENV, 2012).

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

Methodology

ENV (2012)
Syrinx (2012)

(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

A Level 2 fauna survey was undertaken over the larger Wheelarra Hill North area which includes the application area in April and October 2011. This survey identified four broad fauna habitat types (ENV, 2012):

- Alluvial Plains
- Drainage Lines
- Hill
- Gorge

These habitats are all widespread throughout the Pilbara and were all considered to be of moderate habitat value (ENV, 2012). The Alluvial Plains and Hill habitats comprise the large majority of the application area. The Alluvial Plains habitat provides a diverse range of microhabitats, particularly for reptile fauna (ENV, 2012). Habitat diversity of the Hill habitat is considered low, however, extensive rock cover and *Triodia* are important resources for reptile fauna (ENV, 2012). The Drainage Lines habitat only occupies a small part of the application area, however, Eucalypt lined creeks provide greater cover and habitat complexity than vegetation of the surrounding plains and can be used as dispersal corridors for fauna (ENV, 2012). The Gorge habitat occupies the smallest part of the application area, however, it may provide habitat and shelter for a number of conservation significant fauna species (ENV, 2012).

There were three species of conservation significant fauna recorded during the fauna survey; Australian

Bustard (*Ardeotis australis* – Priority 4). Western Pebble-mound Mouse (*Pseudomys chapmani* – Priority 4) and the Rainbow Bee-eater (*Merops ornatus* - Migratory under the *EPBC Act*) (ENV, 2012). Only evidence of the Western Pebble-mound Mouse was recorded within the application area from two inactive mounds (BHPBIO, 2012). However, the other two species recorded would be expected to utilise the application area. The Western Pebble-mound Mouse has been recorded in many areas similar to the application area, and its habitat is well represented throughout the Pilbara (Start et al., 2000). There were three other species that were identified as likely to occur within the application area; Bush Stone-curlew (*Burhinus grallarius* – Priority 4), Peregrine Falcon (*Falco peregrinus* – Schedule 4) and the Fork-tailed Swift (*Apus pacificus* – Migratory under the *EPBC Act*) (ENV, 2012). These species along with the Rainbow Bee-eater and Australian Bustard have a wide distribution and are likely to disperse following clearing. The application area is not likely to represent significant habitat for these species.

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

Methodology BHPBIO (2012)
ENV (2012)
Start et al. (2000)

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

Comments Proposal may be at variance to this Principle

According to available databases, there are no records of any Threatened Flora within the application area (GIS Database). The nearest record of Threatened Flora is *Lepidium catapycnon* located approximately 40 kilometres west of the application area, however, habitat for this species is present within the application area (Syrinx, 2012; GIS Database). The flora survey searched areas of potential habitat and did not record any *Lepidium catapycnon* within the application area (Syrinx, 2012).

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

Methodology Syrinx (2012)
GIS Database:
- Threatened 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

According to available databases, there are no records of any Threatened Ecological Communities (TECs) within the application area (GIS Database). The vegetation survey did not identify any vegetation communities as a TEC (Syrinx, 2012).

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

Methodology Syrinx (2012)
GIS Database:
- Threatened Ecological Sites Buffered

(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 Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 99.9% of the pre-European vegetation remains (see table) (GIS Database, Shepherd, 2009).

The vegetation of the application area has been mapped as following Beard vegetation associations 82 and 216 (GIS Database):

According to Shepherd (2009) approximately 100% of these Beard vegetation associations remains at both a state and bioregional level. Therefore the area proposed to be cleared does not represent 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	17,804,193	17,785,000	~99.9	Least Concern	6.3
Beard veg assoc. – State					
82	2,565,901	2,565,901	~100	Least Concern	10.2
216	280,759	280,759	~100	Least Concern	
Beard veg assoc. – Bioregion					
82	2,563,583	2,563,583	~100	Least Concern	10.2
216	26,670	26,670	~100	Least Concern	

* Shepherd (2009)

** 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 (2009)
GIS Database:
- IBRA WA (Regions - Sub Regions)
- 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

There are a number of minor ephemeral drainage lines within the application area (GIS Database). These watercourses are only likely to flow following significant rainfall events. The vegetation associations 4a and 4b are associated with drainage lines, creek channels and gullies (Syrinx, 2012). Both vegetation associations have been recorded from other vegetation surveys in the local area and 4a is noted as being very widespread locally (Syrinx, 2012). Given the nature of the proposed activities, the clearing of 90 hectares within an area of approximately 2,034 hectares is not expected to have a significant impact on watercourses within the application area.

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

Methodology Syrinx (2012)
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 area is mapped as occurring on the Boolgeeda and Newman land systems, with the large majority of the application area being comprised of the Newman land system (GIS Database). Both of these land systems are generally not prone to erosion (Van Vreeswyk et al., 2004).

The average annual evaporation rate is over eleven times the annual average rainfall so there is a low probability of the proposed clearing causing increased groundwater recharge resulting in rising saline water tables (BoM, 2012; GIS Database).

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

Methodology BoM (2012)
Van Vreeswyk et al. (2004)
GIS Database:
- Evaporation isopleths
- 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 does not lie within any conservation areas or DEC managed lands (GIS Database). The nearest conservation area is Karijini National Park which is located approximately 155 kilometres west of the application area (GIS Database). At this distance the proposed clearing is not likely to have any impacts on the environmental values 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 not located within a Public Drinking Water Source Area (PDWSA) (GIS Database).

There are numerous minor non-perennial watercourses within the application area (GIS Database). The majority of the surface water within the application area is likely to occur as sheet flow following heavy rains. With an annual evaporation rate over eleven times the average annual rainfall any surface water is likely to evaporate quickly (BoM, 2012: GIS Database).

The groundwater within the application area is between 500 – 1,000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database). This is considered to be potable water. It would not be expected that the proposed clearing would cause salinity levels within the application or surrounding area to alter.

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

Methodology BoM (2012)
GIS Database:
- Evaporation Isopleths
- Groundwater Salinity, Statewide
- Hydrography, linear

(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**
With an average annual rainfall of 318.5 millimetres and an average annual evaporation rate of 3,600 millimetres there is likely to be little surface flow during normal seasonal rains (BoM, 2012; GIS Database). Whilst large rainfall events may result in the flooding of the area, the proposed clearing is not likely to lead to an increase in incidence or intensity of flooding.

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

Methodology BoM (2012)
GIS Database:
- Evaporation Isopleths

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

Comments
There is one native title claim over the area under application (GIS Database). This claim (WC05/6) as been registered with the Native Title Tribunal on behalf of the claimant group (GIS Database). However, the mining tenure 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*.

According to available databases, there are no registered 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.

The clearing permit application was advertised on 20 February 2012 by the Department of Mines and Petroleum inviting submissions from the public. There were no submissions received.

- Methodology** GIS Database:
 - Aboriginal Sites of Significance
 - Native Title Claims – Registered with the NNTT

4. References

- BHPBIO (2012) Supporting documentation for a clearing permit application.
- BoM (2012) Climate Statistics for Australian Locations. A Search for Climate Statistics for Newman Aero WA, Australian Government Bureau of Meteorology, viewed 4 May 2012, <http://www.bom.gov.au/climate/averages/tables/cw_007176.shtml>.
- 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.
- ENV (2012) Wheelarra Hill North Fauna Assessment. Unpublished report for BHP Billiton Iron Ore, dated 25 January 2012.
- 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. (2009) 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.
- Start, A.N., Anstee, S.D. & Endersby, M. (2000) 'A review of the biology and conservation status of the Ngadji, *Pseudomys chapmani* Kitchener, 1980 (Rodentia: Muridae)', CALMScience, vol. 3, no.2, pp.125-147
- Syrinx (2012) Wheelarra Hill North Flora and Vegetation Assessment. Unpublished report for BHP Billiton Iron Ore, dated February 2012.
- Van Vreeswyk, A.M.E., Payne, A.L., Leighton, K.A. and Hennig, P. (2004) Technical Bulletin - An Inventory and Condition Survey of the Pilbara Region, Western Australia, No. 92. Department of Agriculture, Government of Western Australia, Perth, Western Australia.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), 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 (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
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 Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

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.

