



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4779/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: BHP Billiton Iron Ore Pty Ltd

1.3. Property details

Property: Miscellaneous Licence 47/95
Local Government Area: Shire of East Pilbara
Colloquial name: Yeerabiddy Siding Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
12		Mechanical Removal	Geotechnical Investigations

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 23 February 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; Shepherd, 2009):

Beard vegetation association 18: Mulga low woodland; continuous;

and

Beard vegetation association 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*.

The application area is covered by the following flora and fauna surveys:

- Astron Level 2 Flora and Vegetation Survey in September 2010 (Astron, 2010); and
- Biologic Area C to Yandi Fauna Survey in August 2010 (Biologic, 2011).

The application area contains five vegetation associations, as described by Astron (2010):

***Triodia* Hummock Grasslands -**

1c: open hummock grassland to closed hummock grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* and *Triodia pungens* with low scattered shrubs to open shrubland of *Acacia hiliiana*, *A. adoxa* var. *adoxo* and *Grevillea wickhamii* subsp. *hispidula* with scattered low trees to low open woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Hakea chordophylla* and *Corymbia hamersleyana* on fine red-brown sandy to clayey loams on hill crests, slopes and some plains;

1e: very open hummock grassland to hummock grassland of *Triodia wiseana* with occasional *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), with low scattered shrubs to shrubland of mixed *Acacia* species and *Grevillea wickhamii* subsp. *hispidula*, with scattered low trees to open woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Hakea chordophylla* and occasionally associated with *Eucalyptus gamophylla* and *E. deserticola* on fine clays to clayey loams on typically rocky upper and midslopes and some plains;

1f: closed hummock grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with scattered low trees of *Eucalyptus leucophloia* subsp. *leucophloia* and *E. trivalva* with scattered tall shrubs of *Acacia sibirica* and *A. bivenosa* on orange-brown fine clayey loams on low open plains/overflow drainage flat;

Eucalyptus Woodland -

2b: woodland of *Eucalyptus camaldulensis* and *E. victix* over tussock grassland of *Eulalia aurea*, *Cyperus vaginatus* and *Cymbopogon* sp. indeterminate over high open shrubland of *Melaleuca glomerata*, *Gossypium robinsonii* and *Acacia tumida* var. *pilbarensis* on brown coarse sands and sandy loams in some major incised creeklines; and

Petalostylis Heath -

4a: open heath to closed heath of *Petalostylis labicheoides* and *Acacia tumida* var. *pilbarensis* with scattered low trees of *Corymbia hamersleyana* and *Eucalyptus gamophylla* over scattered hummock grassland of *Triodia pungens* red-brown fine clayey loams in minor drainage lines.

The Astron (2010) survey indicated that these vegetation associations ranged from high to low local conservation significance.

Clearing Description

BHP Billiton Iron Ore Pty Ltd (BHP Billiton) is proposing to clear up to 12 hectares of native vegetation within a 301 hectare application area for the Yeerabiddy Siding Project (BHP Billiton, 2011). The clearing of vegetation is required for geotechnical investigations involving the following activities:

- Test pit excavations along the proposed siding centreline, with each test pit comprising a disturbance area of up to 36 square metres, including an area to temporarily stockpile soil;
- Borrow pit test pitting in close proximity to the proposed siding, with each test pit comprising a disturbance area of up to 36 square metres;
- Clearing for access tracks to each centreline and borrow test pit (where access via existing tracks is not practicable), and laydown areas (BHP Billiton, 2011).

Vegetation Condition

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

To:

Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).

There is existing land disturbance in the application area from vegetation clearing associated with the construction and maintenance of the existing rail line such as existing access tracks and borrow pits. There is also disturbance by fire and cattle.

Comment

The application area is located in the Hamersley subregion of Western Australia and is situated approximately 85 kilometres north-west of the town of Newman (BHP Billiton, 2011).

The vegetation condition was derived from a vegetation survey conducted by Astron (2010).

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 may be at variance to this Principle

The application area occurs within the Hamersley (PIL3) subregion of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). This subregion is characterised by sedimentary ranges and plateaux, dissected by gorges. At a broad scale, the vegetation can be described as Mulga low woodlands over bunch grasses on fine textured soils in valley floors and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (CALM, 2002).

The vegetation within the application area consists of Beard vegetation associations 18 and 82, which are common and widespread throughout the Pilbara bioregion with approximately 100% of the pre-European vegetation extent remaining (Shepherd, 2009; GIS Database). Studies by Astron (2010) of the application area identified five vegetation types. The condition of these vegetation types classified from 'good' to 'excellent' (Keighery, 1994), depending on the degree of impact by cattle, vehicles, existing vegetation clearance and fire (BHP Billiton, 2011).

Vegetation association 2b was identified by BHP Billiton (2011) as analogous with the major ephemeral watercourses which is described as an "Ecosystem at Risk" in CALM (2002). This means it has a high conservation value, however it is unlikely to be impacted by the proposed clearing based on indicative test pit locations not being located in this area (BHP Billiton, 2011). Additionally, the nature of the clearing proposed is relatively low impact and covers only a small area (12 hectares within the 301 hectare application area).

Potential impacts to vegetation association 2b as a result of the proposed clearing may be minimised by the implementation of a flora management condition, which excludes clearing from this vegetation association.

No Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) were recorded or identified within the application area, or adjacent to the study area, or likely to be affected by the proposal (GIS Database). Furthermore, no vegetation identified within Astron's (2010) survey area is considered analogous to the closest PECs to the application area (i.e. the Priority 1 Weeli Wollli Spring and Fortescue Marsh PECs) (Astron 2010; BHP Billiton, 2011).

A search by the Assessing Officer of the Department of Environment and Conservation (DEC) Declared Rare and Priority Flora databases revealed seven Priority Flora species which may potentially occur within a 20 kilometre radius of the application area. This search revealed one Declared Rare Flora (DRF) – Hamersley *Lepidium* (*Lepidium catapycnon*) (DEC, 2011).

The Astron (2010) survey recorded 91 vascular flora species representing 20 families and 43 genera within the survey area (including the application area). The floristic diversity in the survey area was considered to be considerably low, most likely as a result of poor seasonal conditions and the impact of recent fires. No DRF was recorded within Astron's survey area, or during any other previous surveys covering the application area.

One DEC listed Priority 4 flora species, *Acacia bromilowiana*, was recorded during the survey; however this species was recorded outside the application area. Two additional DEC listed Priority 3 flora species (*Rhagodia* sp. Hamersley and *Sida* sp. Barlee Range) have been identified in previous surveys in the surrounding area, however they have not been recorded in the application area (Astron, 2010; BHP Billiton, 2011).

No introduced flora species were recorded in the application area, although some were identified in the surrounding area (Astron, 2010; BHP Billiton, 2011). Weeds have the potential to significantly change the dynamics of a natural ecosystem and lower the biodiversity of an area. Potential impacts to the biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Biologic (2010) conducted a Level 1 fauna survey over the application area in August 2010 (BHP Billiton, 2011). Biologic (2010) reported that four major fauna habitat types are present in the application area, including two of high conservation significance – Valley and Valley Basalt, due to their potential to support conservation significant species. The Valley, or ironstone valley, is considered common throughout the Pilbara. Basalt valleys are less common in the vicinity of the application area, although they are considered more common to the north (Biologic, 2010). Several conservation significant fauna species have the potential to occur within these habitats, however the area is unlikely to be impacted by the proposed clearing as these areas will be avoided during the geotechnical works due to access and the locations of the test pits on the other side of the existing rail line. Additionally, the nature of the clearing proposed is relatively low impact and the impact on fauna species will be managed by the BHP Billiton Iron Ore Asset Development Projects Environmental Management Plan (ADP EMP) (BHP Billiton, 2011; BHP Billiton, 2012a).

Potential impacts to Valley Basalt habitats as a result of the proposed clearing may be minimised by the implementation of a fauna management condition which excludes clearing from this habitat type. Valley habitat has not been excluded from clearing as there will be some minor impact to this habitat type where it crosses over the railway line to the north. However, the impact will be minor (1-2 test pits only) and the majority of this habitat will be avoided by BHP Billiton (BHP Billiton, 2012b).

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

Methodology Astron (2010)
BHP Billiton (2011)
BHP Billiton (2012a)
BHP Billiton (2012b)
Biologic (2010)
CALM (2002)
DEC (2011)
Keighery (1994)
Shepherd (2009)
GIS Database:
- IBRA WA (regions - subregions)
- Pre-European Vegetation
- Threatened Ecological Sites Buffered

(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 may be at variance to this Principle

Broadly, the fauna habitats which are present in the application area are (Biologic, 2010):

- Hilltops and Slopes;
- Minor Drainage Line;
- Valley (high conservation significance); and
- Valley Basalt (high conservation significance).

An assessment on results from database searches yielded a number of conservation significant fauna potentially occurring in the application area (DEC, 2011). These include the Scheduled species the Northern Quoll (*Dasyurus hallucatus* – Schedule 1) and the Orange Leafnosed Bat (*Rhinoicteris aurantius* – Schedule 1).

Conservation significant fauna species recorded within the application area by Biologic (2010) comprised of two DEC listed Priority 4 species:

- Western Pebble-mound Mouse (*Pseudomys chapmani*) mound; and
- Ghost Bat (*Macroderma gigas*) scats in Cave ACY 1.

It is not anticipated that the proposed geotechnical investigations will impact on Cave ACY 1 as the proposed test pits are located on the other side of the existing rail line. Furthermore, other suitable Ghost Bat habitat has been identified outside the application area (Biologic, 2010). The individual Western Pebble-mound Mouse mound recording will be avoided if practicable through the implementation of BHP Billiton's internal Project Environmental and Heritage Review (PEAHR) and Vegetation Disturbance Approval (VDA) processes. Furthermore, Western Pebble-mound Mouse mounds not previously identified within the application area will be avoided if practicable through the implementation of BHP Billiton's environmental management procedures

(BHP Billiton, 2011).

The Minor Drainage Line habitat is considered common in the Pilbara region and has been identified as potential habitat for significant bird species. However, other minor and major drainage lines have been identified surrounding, and to the north of, the application area. Although the Valley and Valley Basalt habitat types have been recorded as high significance, because they are potential habitat for conservation significant species, only the Ghost Bat (Priority 4) has been recorded in these areas. Impact on these areas will also be minimised by the fact that the location of proposed test pits will not include this area. Additionally, the nature of the clearing proposed is relatively low impact and the impact on fauna species will be managed by the BHP Billiton Iron Ore Asset Development Projects Environmental Management Plan (ADP EMP) (BHP Billiton, 2011; BHP Billiton, 2012).

Potential impacts to Valley Basalt habitat as a result of the proposed clearing may be minimised by the implementation of a fauna management condition which excludes clearing from within this habitat type. Valley habitat has not been excluded from clearing as there will be some minor impact to this habitat type where it crosses over the railway line to the north. However, the impact will be minor (1-2 test pits only) and the majority of this habitat will be avoided by BHP Billiton (BHP Billiton, 2012b).

There is approximately 100% of the pre-European vegetation remaining within the Pilbara bioregion (Shepherd, 2009; GIS Database). Given the extent of the native vegetation remaining in the local area and bioregion, the vegetation to be cleared does not represent a significant ecological link.

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

Methodology Biologic (2010)
BHP Billiton (2011)
BHP Billiton (2012a)
BHP Billiton (2012b)
DEC (2011)
Shepherd (2009)
GIS Database:
- IBRA WA (regions - subregions)
- Pre-European Vegetation

(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 databases, there are no records of Declared Rare Flora (DRF) within the application area (GIS Database). A search of the Department of Environment and Conservation Declared Rare and Priority Flora databases identified one DRF species as potentially occurring within a 20 kilometre radius of the application area – Hamersley Lepidium (*Lepidium catapycnon*) (DEC, 2011).

Vegetation and flora surveys of the application area (Astron, 2010; Biologic, 2010) found no DRF within the application area.

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

Methodology Astron (2010)
Biologic (2010)
DEC (2011)
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 known Threatened Ecological Communities within or adjacent to the application area (GIS Database).

BHP Billiton (2011) does not identify any TECs associated with the application area. The nearest TEC is the Themeda grasslands on cracking clays (Hamersley Station, Pilbara) (Astron, 2010; BHP Billiton, 2011).

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

Methodology Astron (2010)
BHP Billiton (2011)
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 IBRA bioregion (GIS Database). The vegetation within the application area is recorded as:

Beard vegetation association 18: Mulga low woodland; continuous;

and

Beard vegetation association 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wieseana*.

Although several other clearing permits have been granted in the local area, the proposed clearing is not likely to have a significant impact upon vegetation representation at a regional scale due to the extensive amount of vegetation remaining in the bioregion. There is also an extensive amount of vegetation remaining of each vegetation association.

According to Shepherd (2009), Beard vegetation associations 18 and 82 retain approximately 100% of their pre-European extent. Therefore, the areas proposed to be cleared are not a significant remnant of native vegetation in 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	~6.32
Beard vegetation associations - State					
18	19,892,305	19,890,195	~99.9	Least Concern	~0.29
82	2,565,901	2,565,901	~100	Least Concern	~10.24
Beard vegetation associations - Bioregion					
18	676,557	676,557	~100	Least Concern	2.13
82	2,563,583	2,563,583	~100	Least Concern	~10.25

* 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 - 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 may be at variance to this Principle

There are no permanent watercourses or wetlands within the application area, however, there are several minor, ephemeral drainage lines (GIS Database).

The flora and vegetation survey completed by Astron (2010) identified vegetation associations 2b and 4a within the application area, both of these being associated with drainage features. It is anticipated that the area mapped as vegetation association 2b will be avoided by geotechnical investigations as the proposed test pit locations are proposed on the other side of the existing railway line (BHP Billiton, 2011).

Potential impacts to vegetation association 2b as a result of the proposed clearing may be minimised by the implementation of a flora management condition, which excludes clearing from this vegetation association.

Where practical the geotechnical investigations will utilise existing tracks in the vegetation association 4a. Additionally, this association is well represented and commonly recorded across the Pilbara (Astron, 2010).

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

Methodology Astron (2010)
BHP Billiton (2011)
GIS Database:
- Geodata, Lakes
- 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**
According to available databases, the application area is comprised of the:

Rocklea land system: basalt hills, plateaux, lower slopes and minor stony plains supporting hard Spinifex (and occasionally soft Spinifex) grasslands;

Platform land system: dissected slopes and raised plains supporting hard Spinifex grasslands;

Robe land system: low plateaux, mesas and buttes of limonites supporting soft Spinifex (and occasionally hard Spinifex) grasslands; and

Newman land system: Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands (Van Vreeswyk et al., 2004; GIS Database).

All land systems occurring within the application area are common and widespread throughout the Pilbara bioregion (Astron, 2010). Furthermore, the Rocklea, Platform, Robe and Newman land systems have very low soil erosion risk (Van Vreeswyk et al., 2004).

Best-practice environmental management standards will be implemented to minimise the impact of clearing and land disturbance activities on vegetation and soil values. No land disturbance will involve permanent infrastructure and existing cleared areas will be used where possible. Areas disturbed as part of the proposed works (including both test pits and access tracks) will be rehabilitated as per section 19 of BHP Billiton's ADP EMP (BHP Billiton, 2012a).

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

Methodology BHP Billiton (2012a)
Van Vreeswyk et al. (2004)
GIS Database
- Rangeland Land System Mapping

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

Comments **Proposal is not likely to be at variance to this Principle**
The application area is not located within any conservation area (GIS Database). The nearest conservation area is the Karijini National Park, which lies approximately 50 kilometres west of the application area (BHP Billiton, 2011). The small amount of clearing proposed is not likely to impact the environmental values of this area.

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

Methodology BHP Billiton (2011)
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 no permanent watercourses or water bodies within the application area, although there are several minor ephemeral drainage lines (GIS Database). Any surface water within the application area is likely to only remain for short periods following significant rainfall events as the annual evaporation rate exceeds rainfall

(BoM, 2011). Given the small scale of the proposed clearing, there is no reason to expect that surface or groundwater quality in the area would become deteriorated (BHP Billiton, 2011). Clearing of vegetation within vegetation association 4a (minor drainage line) will be limited to the minimum area required for the geotechnical investigations. It is anticipated that the vegetation association mapped by Astron (2010) along a major drainage line (2b) will be avoided by the proposed geotechnical investigations (BHP Billiton, 2011).

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

Methodology BHP Billiton (2011)
BoM (2011)
GIS Database:
- Geodata, Lakes
- Hydrography, Linear
- Public Drinking Water Source Areas

(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 experiences a semi-desert tropical climate with summer cyclonic or thunderstorm events, with an annual average rainfall of approximately 310 millimetres per year (CALM, 2002; BoM, 2011). Rainfall is usually experienced during summer months and can be either cyclonic or through thunderstorm events (CALM, 2002). It is likely that during times of intense rainfall there may be some localised flooding. The small size of the proposed clearing (12 hectares) is unlikely to significantly alter the intensity of flooding within the application area or surrounding areas.

The application area is located within the Fortescue River Upper catchment area. However, given the size of the area to be cleared in relation to the size of the catchment area (2,975,192 hectares), the proposed clearing is not likely to increase the potential for flooding within the application area, local area or within the catchment (GIS Database).

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

Methodology BoM (2011)
CALM (2002)
GIS Database:
- Hydrographic Catchments - Catchments
- Hydrography, Linear

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

Comments

There is one Native Title claim (WC11/6) 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 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*.

There are several 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 9 January 2012 by the Department of Mines and Petroleum inviting submissions from the public. One submission was received regarding the cumulative impact of clearing proposals in this area. This issue has been addressed both in this assessment report and by way of letter sent to the author of the submission.

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

4. References

- Astron (2010) Area C to Yandi, Flora and Vegetation Survey, September 2010.
- BHP Billiton (2011) Rail Operations ? Yeerabiddy Siding Geotechnical Investigation - Application to Clear Native Vegetation (Purpose Permit) Under the Environmental Protection Act 1986, Unpublished document, December, 2011.
- BHP Billiton (2012a) BHP Billiton Iron Ore Asset Development Projects Environmental Management Plan (PP-13-100).
- BHP Billiton (2012b) Personal Communication by Laine Glade-Wright, BHP Billiton to the Assessing Officer, 13 February 2012.
- Biologic (2010) Area C to Yandi Fauna Survey, August 2010.
- BoM (2011) Climate Statistics for Australian Locations: ?Newman?. Bureau of Meteorology. Available at: http://www.bom.gov.au/climate/averages/tables/cw_007151.shtml.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Pilbara 3 (PIL3 ? Hamersley subregion) Department of Conservation and Land Management, Western Australia.
- DEC (2011) NatureMap - Mapping Western Australia Biodiversity, Department of Environment and Conservation, viewed 19 December 2011, <<http://naturemap.dec.wa.gov.au>>.
- 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.
- 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.
- Van Vreeswyk, A.M.E., Payne, A.L., Leighton, K.A & Hennig, P. (2004) An Inventory and Condition Survey of the Pilbara Region, Western Australia, Department of Agriculture, 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.

