Department of Industry and Resources

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2024/2

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 1964*, Mineral Lease 244SA (AML70/244)

Local Government Area: Shire of East Pilbara

Colloquial name: Orebody 25 railway siding

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
50		Mechanical Removal	Mineral Production

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
The vegetation of 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). According to Shepherd et al., (2001) there is approximately 100% of these vegetation types remaining. Ecologia (2005) undertook a flora and vegetation survey of the area surrounding the existing Orebody 25 rail siding and the then proposed alignment of the Orebody 25 rail spur between 21 and 24 March 2005. The survey recorded a total of 64 taxa from 22 families and 40 genera from the area then proposed for the Orebody 25 rail spur. Ecologia (2005) reported that the majority of the proposed rail spur alignment consisted of mature rehabilitated vegetation along an old access track, which had been previously ripped and planted with mixed shrubs and grasses. The rehabilitated vegetation comprised a diverse shrubland community (Ecologia, 2005). The eastern end of the proposed alignment consisted of natural vegetation, comprising moderately dense mulga woodland over moderately dense Triodia pungens (Ecologia, 2005). ENV (2007a) conducted a flora and vegetation survey over the majority of the current application area (which includes the 2005 survey area) between 27 November and 1 December, 2006. The full length of the proposed rail corridor was surveyed on foot, using transects and opportunistic collections (ENV, 2007a). ENV (2007b) conducted a further survey on 7 - 9 May 2007 of four additional areas adjacent to the rail corridor, which were not included in any of the previous surveys.	BHP Billiton Iron Ore Pty Ltd have applied to clear up to 50 hectares of native vegetation within a total application area of approximately 333 hectares, for the extension and upgrade of the existing Orebody 25 rail spur into a siding (BHP Billiton, 2007). The new rail siding will be approximately 8 kilometres in length, and will incorporate approximately 2.5 kilometres of the existing rail spur. The majority of the proposed clearing will be for the construction of the rail siding and associated infrastructure including access tracks and levee banks. Other small areas of clearing will occur for laydown areas, borrow pits and topsoil stockpiles (BHP Billiton, 2007). A previous clearing permit CPS 871/1 was granted for this project on 15 February 2006. This permit authorised the clearing of 4 hectares of native vegetation within an application area of approximately 81 hectares. However design plans for the railway siding and spur-line were changed after the permit was granted, and no clearing was ever undertaken under Permit CPS 871/1 (BHP Billiton, 2007). The current clearing permit application represents the new design	Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994)	The application area is located immediately to the south of the existing Orebody 25 opencut iron ore mine, which is located approximately 8 kilometres north-east of the town of Newman, in the Pilbara region (GIS Database). Clearing permit 2024/1 was originally granted on 22 November 2007, with the permit becoming live on 22 December 2007 and expiring on the 22 December 2009. This Permit has been amended to slightly increase (333 hectares to 334 hectares) the purpose permit clearing boundary. The increase allows for the trenching of three separate power cable lines that will extend from the railroad to a power source loctated between 45 and 120 metres from the current purpose permit boundary. The assessing officer conducted a site visit to all three of the proposed extension areas on 4 of November 2008 to assess the vegetation condition and proposed works. Photos were taken and maps drawn of all three of the proposed sites. All of the sites were highly degraded from the presence of feral herbivours (most likely cows) and historic mining activites. There

This survey included 28, 50 metres x 50 metres quadrats, transects and opportunistic collections (ENV, 2007b).

The vegetation of the application area was classified as five broad vegetation associations (BHP Billiton, 2007). ENV (2007a, 2007b) described the vegetation condition of the majority of the application area as Poor, due to the high incidence of the invasive weed Buffel Grass, *Cenchrus ciliaris*, and substantial previous disturbance from grazing and mining related activities. A low rocky calcrete rise at the eastern end of the rail corridor was largely undisturbed and weed free, and the vegetation of this area was described as Very Good (ENV, 2007a).

plans for the railway siding and spurline, and increases the area applied to clear. The new application area encompasses the area previously approved to clear under CPS 871/1, and therefore some of the supporting information supplied with the original application is also relevant to the current application, and has been referenced in this report.

were no significant vegetation associations or habitat trees in any of the proposed sites.

There will be no increase in the 50 hectares originaly approved to clear under this permit.

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

Surveys conducted over the application area, report that the vegetation types and fauna habitats found within the application area represent a moderate level of biological diversity. Five vegetation associations and four fauna habitat types were identified within the application area (BHP Billiton, 2007). No flora or fauna species or fauna habitat types of conservation significance or restricted distribution were recorded within the application area (BHP Billiton, 2007; Ecologia, 2005; ENV, 2007a; ENV 2007b). The surveys concluded that the vegetation types and fauna habitats found within the application areas are typical of the east Pilbara region and are well represented in the surrounding areas (Ecologia, 2005; ENV, 2007a; ENV 2007b). There is no evidence to suggest that the application area represents an area of higher biological diversity than other areas within the region.

The application area is located immediately adjacent to an operational minesite, mine roads and infrastructure (BHP Billiton, 2007). ENV (2007a, 2007b) recorded the vegetation condition within the application area as ranging from very good to completely degraded, with the majority of the vegetation considered to be in poor condition. Several weed species were recorded within the application area, the most common of which was Buffel Grass, *Cenchrus ciliaris* which occurred in various densities throughout the application area and in some areas reached 80 percent coverage (ENV 2007a, 2007b).

Given the existing disturbance of the site, the proposed clearing is unlikely to have any significant impact on the biological diversity of the region.

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

Methodology

BHP Billiton (2007).
Ecologia (2005).
ENV (2007a).
ENV (2007b).

(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

The application area is immediately adjacent to an existing railway line, an operational mine site, mine roads and infrastructure (BHP Billiton, 2007). The application area has suffered substantial previous disturbance and is unlikely to support significant habitat for fauna.

The application area is immediately adjacent to the existing Orebody 25 minesite. A fauna survey of the Orebody 25 minesite and surrounding areas conducted by Ecologia in June 1995 recorded a total of 52 fauna species (three mammals, 40 birds and nine reptiles) (BHP Billiton, 2007). Two fauna species of conservation significance were recorded in the area surrounding the Orebody 25 minesite: the Western Pebble-mound Mouse, *Pseudomys chapmani* (P4); and the Peregrine Falcon, *Falco peregrinus* (Schedule 4) (Ecologia, 1995, as cited by BHP Billiton, 2005b).

One active mound of the Western Pebble-mound Mouse was recorded within the Orebody 25 survey area (Ecologia, 1995, as cited by BHP Billiton, 2005b). This species is relatively widespread in the Pilbara, and is well represented in areas outside the minesite. The Peregrine Falcon has been recorded in areas adjacent to the minesite, however this species is highly mobile (Ecologia, 1995, as cited by BHP Billiton, 2005b), and is unlikely to be affected by the proposed clearing.

The application area is within close proximity of the Homestead Creek and crosses the creekline in two places. This area is considered to be suitable habitat for the Desert Mouse Pseudomys desertor (Ecologia, 1995, as cited by BHP Billiton, 2005b). However, the additional clearing along the existing rail corridor and adjacent areas is unlikely to have any significant impact on the habitat of this species, which has a wide distribution throughout the arid regions of Western Australia.

Vegetation surveys of the application area conducted in 2006 and 2007 identified four fauna habitat types within the application area (BHP Billiton, 2007). All the fauna habitats types found within the application area were considered to be typical of the east Pilbara region and well represented within the region (ENV, 2007a; ENV 2007b). No fauna habitat types of particular conservation significance or restricted distribution were identified within the application area (Ecologia, 2005; ENV, 2007a; ENV 2007b).

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

Methodology BHP Billiton (2005b).
BHP Billiton (2007).
Ecologia (2005).
ENV (2007a).
ENV (2007b).

(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

The nearest known Declared Rare Flora are six populations of *Lepidium catapycnon* which occur fairly close together approximately 12-14km west/southwest of the western end of the application area (GIS Database). DEC databases have no records of any other populations of Declared Rare or Priority flora within a 50 kilometres radius of the area applied to clear (GIS Database).

Flora and vegetation surveys of the application area were conducted by Ecologia in 2005, and by ENV in 2006 and 2007. No species of Declared Rare or Priority flora were recorded during any of these surveys (Ecologia, 2005; ENV, 2007a; ENV 2007b).

The area proposed to clear is immediately adjacent to an existing railway line, an operational mine site, mine roads and infrastructure (BHP Billiton, 2007). The application area has suffered substantial previous disturbance and is heavily invaded by Buffel Grass, *Cenchrus ciliaris*. The vegetation proposed to clear is unlikely to be necessary for the continued existence of any species of Rare or Priority flora.

Clearing permit CPS 2024/1 was originally granted on the 22 November 2007. BHP Billiton have appied to increase the purpose permit boundary by approximately one hectare.

The assessing officer conducted a site visit to all three of the proposed extension areas on 4 of November 2008 to assess the vegetation condition and proposed works. Photos were taken and maps drawn of all three of the proposed sites. All of the sites were highly degraded from the presence of feral herbivours (most likely cows) and historic mining activites. There were no significant vegetation associations or habitat trees in any of the proposed sites.

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

Methodology Ecologia (2005).
ENV (2007a).
ENV (2007b).
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 (TEC's) within the application area (GIS Database). The nearest known TEC is the Ethel Gorge aquifer stygobiont community which is located approximately 1.8 kilometres north-east of the eastern end of the application area (GIS Database). Groundwater drawdown is listed as a threatening process for the Ethel Gorge stygofauna (CALM, 2002), however, the proposed clearing is not expected to have any effect on groundwater levels.

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

Methodology CALM (2002).

GIS Database:
- Threatened Ecological Communities.

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

Comments

Proposal is not at variance to this Principle

The application area falls within the IBRA Pilbara Bioregion and the Shire of East Pilbara. Shepherd et al. (2001) report that approximately 100% of the pre-European vegetation still exists in the IBRA Pilbara Bioregion, although no specific information is available for the Shire of East Pilbara. The vegetation in the application area is recorded 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). According to Shepherd et al., (2001) there is approximately 100% of these vegetation types remaining.

Although large scale mining operations are located in close proximity to the application area, the region in which the clearing is proposed to occur has not undergone broad scale clearing. Hence the application area does not represent a significant remnant of native vegetation in an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	% of Pre-European area in IUCN Class I-IV Reserves
IBRA Bioregion – Pilbara	17,804,164	17,794,164	99.9	Least Concern	6.3
Beard veg assoc. – State					
18	19,892,437	19,890,348	100	Least Concern	2.1
29	7,904,064	7,904,064	100	Least Concern	0.3
82	2,565,930	2,565,930	100	Least Concern	10.2
Beard veg assoc. – Bioregion					
18	676,561	676,561	100	Least Concern	16.8
29	1,133,228	1,133,228	100	Least Concern	1.9
82	2,563,610	2,563,610	100	Least Concern	10.2

* Shepherd et al. (2001) updated 2005
** Department of Natural Resources and Environment (2002)

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

Methodology

Dept of Natural Resources and Environment (2002).
Shepherd et al. (2001).
GIS Database:
- 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

The proposed railway siding crosses Homestead Creek in two places. Homestead Creek is dry for most of the year, only flowing briefly immediately following significant rainfall (BHP Billiton, 2005b; GIS Database). Three other minor seasonal tributaries of the creek also cut through the application area (GIS Database).

Culverts will be installed where the rail line crosses the creek , which will maintain normal water flows and minimise disturbance of the creekline (BHP Billiton, 2007). The Department of Water (DoW) has issued the proponent with a Permit to Obstruct or Interfere with a Proclaimed Watercourse, for the proposed creek crossings, under s.17 of the *Rights in Water and Irrigation Act 1914* (DoW, 2007). The proposed clearing will impact on a small amount of riparian vegetation where the rail line crosses Homestead Creek, and this disturbance has been assessed and approved as part of the abovementioned permit issued by DoW (BHP Billiton, 2007; DoW, 2007).

As the proposed clearing will impact on vegetation associated with a watercourse, the proposal is at variance to this Principle. However, the proposed clearing is unlikely to result in any significant impact on Homestead Creek or any other watercourse or wetland.

Methodology BHP Billiton (2005b).
BHP Billiton (2007).
DoW (2007).
GIS Database:
- Hydrography, Linear.
- Lakes, 1M.
- Rivers 250K.

(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 soils within the adjacent Orebody 25 Mine area are mainly stony, shallow loams (Ecologia, 2005). The application area is located on the northern edge of the Homestead Creek flood-plain, on gently rising slopes (BHP, 2005b). The proponent has made a commitment to minimise erosion and implement sediment control measures as required (BHP Billiton, 2007).

The application area lies within the Newman and Elimunna Land Systems (GIS Database). The Newman Land System consists of jaspolite plateaux ridges and mountains, and is generally not prone to soil erosion (DAFWA, 2007).

The Elimunna Land System is described as stony plains on basalt, supporting sparse Acacia and Cassia shrublands and patchy tussock grasslands on red loamy earths and clay soils (DAFWA, 2007). The soils on these level plains are likely to be protected from erosion by stony mantles. This land system is not generally regarded as being susceptible to soil erosion, however caution will be needed where the proposed works cross Homestead Creek (DAFWA, 2007).

The construction of drains, culverts and levees will maintain surface water flows across the application area and minimise any potential erosion (BHP Billiton, 2007).

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

Methodology BHP Billiton (2007).
DAFWA (2007).
Ecologia (2005).
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**

There are no conservation areas in the vicinity of the application area. The nearest DEC managed lands are the Collier National Park, approximately 120 kilometres south-south-west of the application area; and the Karijini National Park, approximately 120 kilometres west-north-west of the application area (GIS Database).

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

Methodology GIS Database:
- CALM Managed Lands and Waters.

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

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

The application area is located within the Newman Water Reserve, a Public Drinking Water Source Area (PDWSA) (GIS Database). All activities conducted within the PDWSA, should be in accordance with the Department of Water (DoW) Land Use Compatibility Tables (DoW, 2007). The proponent is advised to follow the Water Quality Protection Guidelines for the mining and mineral industry, produced by the DoW, to minimise any risk that the proposed clearing and associated activities may pose to the Water Reserve (DoW, 2007). Groundwater quality monitoring is conducted as part of the existing mine operations at the adjacent Orebody 25 minesite (BHP Billiton, 2007).

The proposed clearing area crosses the Homestead Creek in two places (GIS Database; BHP Billiton, 2007),

and the DoW has issued the proponent with a Permit to Obstruct or Interfere with a Proclaimed Watercourse for these creek crossings (DoW, 2007). The creek is dry most of the year, only flowing briefly following significant rainfall. Culverts will be installed at the two creek crossings, and at other suitable points along the siding, to maintain natural surface water flows (BHP Billiton, 2007).

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

Methodology BHP Billiton (2007).
DoW (2007).
GIS Database:
- 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 is located on the northern edge of the Homestead Creek flood-plain, on gently rising slopes (BHP Billiton, 2007). Natural flooding occurs occasionally during the wet season (November to March) following significant rainfall (BHP Billiton, 2007).

The proposed rail siding crosses the Homestead Creek in two places, and culverts will be installed at these locations, to ensure continuation of natural water flows during rainfall events and to prevent flooding upstream. In addition, flood control levees will be constructed adjacent to each of the culverts, to direct surface water flows through the culverts during extreme rainfall events (BHP Billiton, 2007).

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

Methodology BHP Billiton (2007).

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

Comments

There is one Aboriginal site of significance on the northern boundary of the area applied to clear, and several other sites within close proximity (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged through the clearing process.

There is a native title claim (WC05/006) over the area under application. This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mining tenement has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (ie. 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*.

One public submission was received for this clearing permit application. The submission suggested that the vegetation proposed to be cleared should be considered as a significant remnant of native vegetation in an area that has been extensively cleared. This issue has been addressed under Principle (e).

The submission also raised concerns regarding potential impacts of the proposed clearing on Aboriginal Heritage sites and Native Title Rights within the application area. Aboriginal Sites of Significance are protected under the *Aboriginal Heritage Act 1972*. The proponent is committed to the management and protection of Aboriginal heritage sites (BHP Billiton, 2005a). BHP Billiton has a heritage protocol agreement with the traditional owners of the Orebody 25 area, and regularly consult with the traditional owners to undertake Aboriginal heritage surveys in and around Newman (BHP Billiton, 2007). BHP Billiton also has an internal process; the Project Environment and Aboriginal Heritage Review (PEAHR), which is designed to prevent inadvertent disturbance of Aboriginal heritage sites within BHP Billiton operations. Prior to the commencement of any land disturbance activity, a PEAHR must be completed and submitted to BHP Billiton's Aboriginal Affairs Department, for assessment. All land disturbance activities must be approved by BHP Billiton's Environment and Aboriginal Heritage staff (BHP Billiton, 2005a). The proponent has advised that indigenous surveys have been conducted over the project area, and no indigenous heritage sites were found (BHP Billiton, 2007).

The application area is within the Newman Water Reserve, a Public Drinking Water Source Area (PDWSA) (GIS Database). The Department of Water (DoW) has advised that all activities conducted within the PDWSA should be compatible with the DoW's Land Use Compatibility Tables (DoW, 2007). The proponent is advised to seek further advice from the DoW to ensure compliance in this regard. The proposed railway siding crosses Homestead Creek in two places, and the DoW has issued the proponent with a Permit to Obstruct or Interfere with a Proclaimed Watercourse, for the proposed creek crossings, under s.17 of the *Rights in Water and Irrigation Act 1914* (DoW, 2007).

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, or any other licences or approvals are required for the proposed works.

Clearing permit 2024/1 was originally granted on 22 November 2007, with the permit becoming live on 22 December 2007 and expiring on the 22 December 2009.

This Permit has been amended to slightly increase (333 hectares to 334 hectares) the purpose permit clearing boundary. The increase allows for the trenching of three separate power cable lines that will extend from the railroad to a power source loctated between 45 and 120 metres from the current purpose permit boundary.

The assessing officer conducted a site visit to all three of the proposed extension areas on 4 November 2008 to assess the vegetation condition and proposed works. Photos were taken and maps drawn of all three of the proposed sites. All of the sites were highly degraded from the presence of feral herbivours (most likely cows) and historic mining activites. There were no significant vegetation associations or habitat trees in any of the proposed sites.

There will be no increase in the 50 hectares originaly approved to clear under this permit.

Methodology

BHP Billiton (2005a).
BHP Billiton (2007).
DoW (2007).
GIS Database:
- Aboriginal Sites of Significance.
- Native Title Claims.
- Public Drinking Water Source Areas.

4. Assessor's comments

Comment

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

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

5. References

BHP Billiton (2005a) Aboriginal Heritage Induction Handbook. BHP Billiton Iron Ore Pty Ltd, Western Australia.

BHP Billiton (2005b) Orebody 25 Rail Siding Vegetation Clearing Permit Supporting Documentation. BHP Billiton Iron Ore Pty Ltd, Western Australia.

BHP Billiton (2007) Orebody 25 Rail Siding Clearing (Purpose) Permit Application Supporting Documentation. August 2007. BHP Billiton Iron Ore Pty Ltd, Western Australia.

CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.

DAFWA (2007) Land degradation assessment report. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Industry and Resources (DoIR). Office of the Commissioner of Soil and Land Conservation, Department of Agriculture and Food Western Australia.

Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.

DoW (2007) Public Drinking Water Source Area (PDWSA) Advice. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Industry and Resources (DoIR). Department of Water, Western Australia.

Ecologia (2005) BHPBIO Rail Sidings Flora and Vegetation Assessment. Ecologia Environment, Western Australia.

ENV (2007a) RGP4 Orebody 25 Rail Spur Siding Declared Rare and Priority Flora Survey. ENV Australia Pty Ltd, Western Australia, February 2007.

ENV (2007b) RGP4 NJV Orebody 25 Rail Alignment Flora and Vegetation Assessment. ENV Australia Pty Ltd, Western Australia, June 2007.

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., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.

6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
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.