Government of **Western Australia**
Department of **Mines and Petroleum**

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4481/1
Permit type: Area Permit

1.2. Proponent details

Proponent's name: **BHP Billiton Worlsey Alumina Pty Ltd**

1.3. Property details

Property: *Alumina Refinery (Worsley) Agreement Act 1973,* Mining Lease 258SA (AM 70/ 258), Lease 3116/7574, Document I 150306 L, Lot 5314 on Deposited Plan 220209.
Alumina Refinery (Worsley) Agreement Act 1973, Mining Lease 258SA (AM 70/ 258), Lease 3116/8072, Document I 154246 L, Lot 5315 on Deposited Plan 220209.
Local Government Area: Shire of Collie
Colloquial name:

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
5.04		Mechanical Removal	Road Construction or Maintenance, Stockpile Areas and Associated Activities.

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 8 September 2011

2. Background

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
Beard Vegetation Associations have been mapped for the whole of Western Australia. One Beard Vegetation Association is located within the application areas (Shepherd, 2009): **Beard Vegetation Association 3**: Medium Forest; Jarrah - Marri. Mattiske (1999) conducted a flora and vegetation survey over the application areas which identified the following four vegetation types (Mattiske Consulting, 1999): **Q:** Open forest of *Eucalyptus marginata – Corymbia calophylla – Eucalyptus patens* with dense understorey of *Trymalium floribundum*, *Acacia extensa* and *Phyllanthus calycinus* on lower steeper slopes with loam – gravelly soils. **S:** Open forest of *Eucalyptus marginata – Banksia grandis – Allocasuarina fraseriana* with scattered understorey, including *Adenanthos barbiger*, *Leucopogon capitellatus* and *Styphelia tenuiflora* on upper slopes with gravelly soils. **ST:** Open forest of *Eucalyptus marginata – Corymbia calophylla* with scattered understorey, including *Leucopogon capitellatus, Bossisea aquifolium* subsp. *Aquilifolium*, *Leucopogon verticillatus, Lasiopetalum floribundum* and *Styphelia tenuiflora* on upper slopes. **TS:** Open forest of *Eucalyptus marginata* –	BHP Billiton Worsley Alumina Pty Ltd proposes to clear up to 5.04 hectares of native vegetation to widen an existing road to enhance safety for trucks along the outer bauxite residue deposition area, to extend a go bay and to put in an access for light vehicles to segregate them from heavy vehicles. In addition BHP Billiton Worsley Alumina Pty Ltd proposes the establishment of additional stockpile areas for clay, gravel and woodchips. The proposed clearing is located within the existing BHP Billiton Worsley Alumina refinery lease area. The application areas are located approximately 14 kilometres north-west of Collie (GIS Database).	Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994) To Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery,1994).	The vegetation condition rating is derived from aerial imagery and a flora and vegetation survey conducted over the application areas by Mattiske (1999). The application areas are located within the existing BHP Billiton Worsley Alumina refinery lease area and adjacent to existing cleared areas utilised for refinery purposes.

Corymbia calophylla - Banksia grandis with scattered understorey, including *Leucopogon verticillatus, Pteridium esculentum, Clematis pubescens and Bossiaea aquifolium subsp. aquifolium on mid to upper slopes.*

3. Assessment of application against Clearing Principles

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

Comments

Proposal is not likely to be at variance to this Principle

The application areas are located within the Northern Jarrah Forest subregion of the Jarrah Forest Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). One Beard Vegetation Association is located within the application areas (Shepherd, 2009): Beard Vegetation Association 3: Medium Forest; Jarrah - Marri.

CALM (2002) reports that the vegetation of the Northern Jarrah Forest comprises Jarrah - Marri forest in the west with Bullich and Blackbutt in the valleys grading to Wandoo and Marri woodlands in the east with Powder bark on breakaways. The majority of the diversity in the communities occurs on the lower slopes or near granite soils where there are rapid changes in site conditions. Beard Vegetation Association 3 retains approximately 82% of its pre-European vegetation extent within the Northern Jarrah Forest subregion (Shepherd, 2009).

A detailed flora and vegetation survey was completed by Mattiske for the refinery lease area in 1999. A total of 266 vascular plant species from 52 plant families and seventeen site vegetation types were recorded within the survey area (Mattiske, 1999). Two site vegetation types D and E were identified by Mattiske (1999) to be less well represented within the conservation estate and these areas were identified as being sites in which clearing should be avoided. No restricted vegetation types are included in the areas proposed to be cleared.

There are three species of Priority Flora located within a 10 kilometre radius of the application areas which occur in the same broad vegetation and soil types to those within the areas applied to be cleared. A survey conducted by Mattiske (1999) did not identify any Priority Flora species within the areas under application.

A baseline vertebrate fauna survey was conducted over four seasons during 2000 and 2001 within the refinery lease area. A further assessment for the presence of the Western Ringtail Possum (*Pseudocheirus occidentalis* - Schedule 1, Vulnerable), was undertaken over three days in May 2007 (Ninox Wildlife Consulting, 2001 and 2007). The baseline survey identified 59 species of native birds, 13 native mammals and 18 reptiles within the refinery lease area. The 2007 survey for the Western Ringtail Possum did not identify evidence of this species however Red-tailed Black Cockatoos were observed within the survey area. Ninox Wildlife Consulting (2007) recommended that a dampland located at the south of the survey area should be retained if possible. Diggings of the Quenda (*Isoodon obesulus fusciventer* - Priority 5) were observed in this area however this dampland does not form part of the areas proposed for clearing.

There are no Threatened or Priority Ecological Communities within a 30 kilometre radius of the areas to be cleared. The application areas are located directly adjacent to the active BHP Billiton Worsley Alumina Refinery and approximately 50% of the vegetation to be cleared is in completely degraded condition (GIS Database; Keighery, 2004). The vegetation types and fauna habitats present within the application areas are well represented in the Northern Jarrah Forest subregion and are unlikely to represent significant habitat for fauna in a regional context. The application areas may have potential to contain some larger habitat trees which could provide habitat for some conservation significant species, however, it is not likely that the areas to be cleared comprise a high level of biological diversity in a regional context.

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

Methodology

CALM (2002)
Keighery (1994)
Mattiske (1999)
Ninox Wildlife Consulting (2001)
Ninox Wildlife Consulting (2007)
Shepherd (2009)
GIS Database:
- Declared Rare and Priority Flora List
- IBRA WA (Regions - Subregions)
- Collie Orthomosaic - Landgate 2008
- 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

Two fauna surveys have been conducted over the application areas by Ninox Wildlife Consulting in 2001 and

2007. The baseline vertebrate fauna survey was conducted over four seasons during 2000 and 2001 within the refinery lease area. The baseline survey identified 59 species of native birds, 13 native mammals and 18 reptiles within the refinery lease area. Two fauna sampling sites during this survey were located in vegetation types associated with the application areas (vegetation types ST and Q) (Mattiske, 1999).

A further assessment for the presence of the Western Ringtail Possum (*Pseudocheirus occidentalis* - Schedule 1, Vulnerable), was undertaken over three days in May 2007 (Ninox Wildlife Consulting, 2007). The 2007 survey for the Western Ringtail Possum did not identify evidence of this species however Red-tailed Black Cockatoos were observed within the survey area.

Based on these surveys 9 conservation significant species have the potential to occur within the refinery lease area (Ninox Wildlife Consulting, 2001 and 2007):

- Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso)* - Schedule 1, Vulnerable;
- Baudin's Black-Cockatoo (*Calyptorhynchus baudinii)* - Schedule 1, Vulnerable;
- Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris)* - Schedule 1, Vulnerable;
- Water Rat (*Hydromys chrysogaster)* - Priority 4;
- Western Brush Wallaby (*Macropus Irma)*- Priority 4;
- Southern Brown Bandicoot (Quenda) (*Isoodon obesulus fusciventer)* – Priority 5;
- Peregrine Falcon (*Falco peregrines)* - Other Specially Protected Fauna;
- Rainbow Bee-eater (*Merops ornatus)* - Schedule 3, Migratory*;* and
- Fork-tailed Swift (*Apus pacificus)* - Schedule 3, Migratory.

The vegetation under application is unlikely to provide an ecological link or corridor for native fauna movement due to the adjacent BHP Worsley Alumina Refinery and the high level of existing disturbance in the area. The habitats associated with the application areas are well represented within the Northern Jarrah Forest subregion. Ninox Wildlife Consulting (2007) has recommended that a dampland located at the south of the 2007 survey area be retained if possible. Diggings of the Quenda (*Isoodon obesulus fusciventer* - Priority 5) were observed in this area, however, this dampland does not form part of the areas proposed for clearing.

Ninox Wildlife Consulting (2001 and 2007) report observing threatened Black-Cockatoo species within the refinery lease area. However, given that large parts of the areas under application are in completely degraded condition (Keighery, 1994; GIS Database) and located within and directly adjacent to the active alumina refinery operations it is unlikely that the vegetation to be cleared is a significant food source for Black Cockatoos. Considering that parts of the areas applied to be cleared are predominantly Jarrah – Marri forest which has the potential to contain larger hollow forming habitat trees, the areas proposed to be cleared may provide some suitable habitat for conservation significant species however the implementation of a fauna management condition will reduce the impact of the clearing upon individual species that may be utilising these trees.

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

Methodology

Keighery (1994)
Mattiske (1999)
Ninox Wildlife Consulting (2001)
Ninox Wildlife Consulting (2007)
GIS Database:
- Collie Orthomosaic - Landgate 2008

(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

There is one species of declared rare flora (*Grevillea rara*) located within a 10 kilometre radius of the proposed clearing which occurs in similar vegetation and soil types to those of the application areas. A detailed flora and vegetation survey undertaken by Mattiske in 1999 of the refinery lease area, however, did not identify this species.

Grevillea rara is currently known from six populations located in State Forest surrounding the Harris Dam, 8 kilometres east of the areas applied to be cleared. The Department of Environment and Conservation's recovery plan for *Grevillea rara* (2009) identifies critical habitat for the species as the area of occupancy of the current populations and areas of similar habitat surrounding the current populations. There have been extensive surveys for *Grevillea rara* in the vicinity of the current populations and of watercourse areas within a 20 kilometre radius including opportunistic surveys and a 3 day survey conducted by staff of the WA herbarium (Department of Environment and Conservation, 2009). No further populations of the species were identified.

Given that the species is locally restricted to the State Forest surrounding the Harris Dam and the extent of surveys conducted in the local area it is not likely that the areas proposed to be cleared include or are necessary for the continued existence of this species.

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

Methodology Department of Environment and Conservation (2009)
Mattiske (1999)
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 (TECs) within the areas under application and the closest known TEC is located approximately 26 kilometres southwest of the application areas (GIS Database).

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

Methodology 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**

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves (and post clearing %)
IBRA Bioregion - Jarrah Forest	4,506,656	2,514,549.90	~56	Least Concern	14 (25)
IBRA Subregion - Northern Jarrah Forest	1,898,780	1,157,898	~61	Least Concern	10 (16)
Local Government – Shire of Harvey	170,787	90,549	~53	Least Concern	3 (3)
Beard vegetation association - State					
3	2,661,405	1,862,966	~70	Least Concern	18 (26)
Beard vegetation association - Bioregion					
3	2,390,591	1,657,963	~69	Least Concern	16 (23)
Beard vegetation association - Subregion					
3	908,099	745,157	~82	Least Concern	12 (15)

*Shepherd (2009)
** Department of Natural Resources and Environment (2002)

Beard Vegetation Association 3 retains approximately 82% of its pre-European vegetation extent within the Northern Jarrah Forest subregion which is more than the 30% threshold level recommended in the National Objectives Targets for Biodiversity Conservation below which, species loss appears to accelerate exponentially at an ecosystem level (EPA, 2000).

Given that the vegetation is well represented locally and regionally the vegetation within the areas proposed for clearing are not likely to be significant as a remnant in a highly cleared landscape.

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

Methodology Department of Natural Resources and Environment (2002)
EPA (2000)
Shepherd (2009)
GIS Database
- Interim Biogeographic Regionalisation of Australia

(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 is one minor perennial watercourse mapped within 70 metres of the areas under application which is located within close proximity to the refinery freshwater lake (GIS Database). This water course feeds into the lake which supplies water to the site for processing purposes. Water from this lake also feeds into the Augustus River (located 2 kilometres east of the application areas) during overflow and when an obligatory summer flow is maintained (BHP Billiton Worsley Alumina Pty Ltd, 2011).

Mattiske (1999) has mapped vegetation types which are growing in association with watercourses within the refinery lease area, however, these vegetation types have not been mapped within the application areas. Given the proximity of parts of the application area to a mapped watercourse and the refinery freshwater lake, the application areas may contain some riparian vegetation.

However, these areas exist within a highly modified refinery environment and considering the completely degraded condition of the vegetation in these areas (GIS Database; Keighery, 1994) it is unlikely that the removal of this vegetation will have any significant environmental impacts on watercourses or wetlands.

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

Methodology

BHP Billiton Worsley Alumina Pty Ltd (2011)
Keighery (1994)
Mattiske (1999)
GIS Database
- Collie Orthomosaic - Landgate 2008
- Hydrography, linear

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments

Proposal may be at variance to this Principle

The BHP Worsley Alumina refinery lease area occurs on the lateritic capped archaean granite and metamorphic rocks of the Darling Plateau (CALM, 2002). A study of the landforms and soil units of the Darling System has been undertaken by Churchward and McArthur (1980). Two landforms and soil units are represented within the application areas;

- Dwellingup – Gently undulating landscape with duricrust on ridges; sand and gravels in shallow depressions; and
- Yarragil – Valleys of the western part of the plateau; sandy gravels on the slopes; orange earth in swampy floors.

Groundwater within the application areas has marginal salinity levels of between 500 to 1000 milligrams per litre (Total Dissolved Solids) (GIS Database). Given the size of the areas to be cleared (5.04 hectares) in relation to the already cleared areas of the refinery lease area the main land degradation risk associated with the removal of the vegetation is considered to be water erosion.

The application areas are located directly adjacent to the existing cleared areas of the BHP Worsley Alumina Refinery. BHP Billiton Worsley Alumina Pty Ltd (2011) has identified that drainage from the application areas will be directed to silt traps before feeding into the refinery freshwater lake.

The application areas are to be cleared for the purposes of widening an existing haul road, extending a go bay, vehicle access and the creation of stockpile areas. Given the existing roadside and refinery infrastructure already in place to manage drainage it is unlikely that the proposed clearing will substantially increase the potential for water erosion and any potential water erosion risks are likely to be short term during the construction period. The implementation of a revegetation condition will minimise this impact in the long term.

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

Methodology

BHP Billiton Worsley Alumina Pty Ltd (2011)
CALM (2002)
Churchward and McArthur (1980)
GIS Database
- Hydrography, linear
- Topographic Contours – Statewide
- Groundwater Salinity

(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 may be at variance to this Principle

The proposed clearing is located wholly within the Harris River State Forest which occupies an area of approximately 16,000 hectares (GIS Database).

The areas proposed to be cleared are located next to the existing cleared areas associated with the alumina refinery. These areas have undergone a high level of disturbance due to present and historic clearing activities associated with the operation of the alumina refinery. Given the extent of the Harris River State Forest which surrounds the refinery site the vegetation proposed for clearing is unlikely to act as a significant ecological linkage or buffer.

The areas under application lie within a region that is subject to moderate levels of rainfall and there may be increased potential for the spread of dieback (*Phytophthora cinnamomi*) or weed species through the movement of topsoil. A survey conducted by Glevan Consulting (2009) has mapped dieback within the refinery lease area and although the majority of the lease area is infested there are several areas which are uninfested. These have been identified by BHP Billiton Worsley Alumina Pty Ltd as dieback free protectable areas (BHP Billiton Worsley Alumina Pty Ltd, 2011). The implementation of a weed and dieback condition will reduce the risk of the spread of dieback to dieback free protectable areas.

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

Methodology

BHP Billiton Worsley Alumina Pty Ltd (2011)
Glevan Consulting (2009)
GIS Database:
- CALM Managed Lands

(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 lies within the Brunswick Catchment Area however a priority classification has not been assigned to the area covered by the refinery lease area. Advice from the Department of Water (2011) did not identify any objections to the proposed clearing.

There is one minor perennial watercourse mapped within 70 metres of the areas under application (GIS Database) and the part of the application area is located in close proximity to the refinery freshwater lake. The refinery freshwater lake supplies water to the site for processing purposes. Water from this lake also feeds into the Augustus River (located 2 kilometres east of the application areas) during overflow and when an obligatory summer flow is maintained (BHP Billiton Worsley Alumina Pty Ltd, 2011).

The application areas are located directly adjacent to the existing cleared areas of the BHP Worsley Alumina Refinery. BHP Billiton Worsley Alumina Pty Ltd (2011) have identified that drainage from the areas will be directed to silt traps before feeding into the refinery freshwater lake. The northern part of the application area is to be cleared for the purpose of widening an existing haul road. Given the existing roadside infrastructure already in place to manage drainage it is unlikely that the proposed clearing will increase the potential for water erosion and sedimentation in this area and any potential risks are likely to be short term during the construction period.

Given that all surface water from the cleared refinery area drains from the site to the refinery lake before overflowing to the Augustus River it is unlikely that the clearing of native vegetation will cause any further deterioration in surface water quality downstream of the refinery lease area in the Augustus River.

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

Methodology

BHP Billiton Worsley Alumina Pty Ltd (2011)
CALM (2002)
Department of Water (2011)
GIS Database
- Hydrography, linear
- Topographic Contours – Statewide

(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

All surface water from the cleared refinery area drains from the site to the refinery freshwater lake. Water from this lake also feeds into the Augustus River (located 2 kilometres east of the application areas) during overflow and when an obligatory summer flow is maintained (BHP Billiton Worsley Alumina Pty Ltd, 2011).

Given the above the clearing of 5.04 hectares of native vegetation within the refinery lease area is unlikely to cause, or exacerbate the incidence or intensity of flooding.

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

Methodology BHP Billiton Worsley Alumina Pty Ltd (2011)
GIS Database
- Hydrography, linear

Planning instrument, Native Title, RIWI Act Licence, EP Act Licence, Works Approval, Previous EPA decision or other matter.

Comments There is one Native Title Claim (WC98/58) over the areas 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 no registered Aboriginal Sites of Significance within the application areas (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 18 July 2011 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received.

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

4. Assessor's recommendations

Comment / recommendation

The application has been assessed against the clearing principles, planning instruments and other matters in accordance with s.51O of the *Environmental Protection Act 1986*, and the proposed clearing may be at variance to Principles (b), (f), (g) and (h), is not likely to be at variance to Principles (a), (c), (d), (i) and (j) and is not at variance to Principle (e).

5. References

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

BHP Billiton Worsley Alumina Pty Ltd (2011) Clearing Permit Application Supporting Documentation. January 2011.

Churchward, H.M. and McArthur (1980) Landforms and Soils of the Darling System. In: *Atlas of Natural Resources, Darling System, Western Australia*. Perth, Pinjarra and Collie Sheets. Department of Conservation and Environment, Western Australia.

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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.

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EPA (2000) Environmental protection of native vegetation in Western Australia. Clearing of native vegetation, with particular reference to the agricultural area. Position Statement No. 2. December 2000. Environmental Protection Authority, Western Australia.

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Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Mattiske (1999) Flora and Vegetation of Collie Refinery Lease Area, Prepared by Mattiske Consulting Pty Ltd, July 1999.

Ninox Wildlife Consulting (2001) The Vertebrate Fauna of the Refinery Lease Area and Mornington Mills Block. Prepared for Worsley Alumina Pty Ltd. December 2001.

Ninox Wildlife Consulting (2007) An Assessment of the Presence of the Western Ringtail Possum at the Worsley Alumina Pty Ltd Refinery near Collie Western Australia. Prepared for Worsley Alumina Pty Ltd. June 2007.

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.

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.