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

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 5947/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **GMA Garnet Pty Ltd**

1.3. Property details

Property: Mining Lease 70/968
Local Government Area: Shire of Northampton
Colloquial name: Port Gregory Mine

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 10 April 2014

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
Beard Vegetation Associations have been mapped for the whole of Western Australia and are useful to look at vegetation extent in a regional context. Two Beard Vegetation Associations have been mapped within the application area (GIS Database): **17:** Shrublands; *Acacia rostellifera* thicket; and **371:** Low forest; *Acacia rostellifera*. A flora survey was undertaken over the application area and the rest of the tenement by ecologists from GHD in August 2013. Five vegetation types were recorded during the survey and three of these were mapped within the application area (GHD, 2013b). These are described below. **1: Mixed Open Heath on Sandy Limestone Ridge -** High Open Shrubland of *Acacia rostellifera*, *Melaleuca cardiophylla*, *Grevillea argyrophylla*, over Shrubland of *Olearia* sp. Kennedy Range, *Hibiscus huegelii*, over Low Shrubland of *Pimelea angustifolia*, *Diplopeltis petiolaris*, *Acanthocarpus preissii* over Scattered Grasses of **Avena barbata*, *Austrostipa* spp., over Mixed Herbs of **Lysimachia arvescens*, *Goodenia beardiana*, *Erodium* sp. with Scattered Climbers of **Cuscuta* sp., *Dioscorea hastifolia*, *Commicarpus australis*; **4: Melaleuca Thickets -** Closed Scrub of *Melaleuca cardiophylla* with Mallee of *Eucalyptus* spp. over Low Shrubs of *Rhagodia latifolia*, *Lasiopetalum angustifolium* with Scattered Climbers of *Aphanopetalum clematideum*, *Dioscorea hastifolia*; and **5: Cleared/Degraded -** Cleared Tracks and firebreaks, old pits with regrowth of *Acacia rostellifera*, pasture grasses and weeds. *introduced species	Port Gregory Mine. GMA Garnet Pty Ltd proposes to clear up to 30 hectares of native vegetation, within a total boundary of approximately 32 hectares, for the purpose of garnet ore extraction. The project is located approximately 4 kilometres north-east of Port Gregory in the Shire of Northampton.	Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994); To: Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).	The vegetation condition is based on a flora and vegetation survey by ecologists from GHD (2013b). Vegetation will be cleared by dozers or graders. Vegetation and topsoil will be stockpiled for later use in rehabilitation or directly returned to previously cleared areas. The clearing will be up to 5 hectares per year.

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 Geraldton Hills subregion of the Geraldton Sandplains Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). The vegetation of the subregion is characterised by sand heaths with emergent *Banksia* and *Actinostrobus*, York Gum woodlands on alluvial plains, proteaceous heath and *Acacia* scrubs on limestone depending on depth of coastal-sand mantle, low closed forest of *Acacia rostellifera* (now cleared) on alluvial plains of Greenough and Irwin River (behind beach dune system south of Geraldton) (CALM, 2002).

A total of 75 vascular flora taxa, from 39 families, were recorded in the flora survey of Mining Lease 70/968, which includes the application area, by ecologists from GHD (2013b). This is considered to be a good reflection of the relatively small area surveyed and the geology of the area (GHD, 2013b). The most speciose families were Asteraceae, Poaceae, Fabaceae, Malvaceae and Myrtaceae (GHD, 2013b). The floristic diversity is considered to be equivalent to that found in the local and regional area in similar condition, with the region considered to be of moderate biodiversity (GHD, 2013b).

No Threatened Ecological Communities or Priority Ecological Communities were recorded within the application area during the GHD vegetation survey or have previously been recorded within the application area (GHD, 2013b; GIS Database).

No Threatened or Priority Flora was recorded within the survey area during the GHD flora and vegetation survey (GHD, 2013b). The survey area does contain suitable habitat for the Threatened orchid species *Caladenia bryceana* subsp. *cracens* and this species may have been missed because of its small size (1-2 centimetres), inadequate survey, poor winter rainfall resulting in poor/no flowering or the habitat being degraded (DPaW, 2014). The vegetation in very good to excellent condition would be the most likely areas to provide suitable habitat for the species (DPaW, 2014). The GHD survey identified the north-eastern portion of the survey area as very marginal habitat for the species, with some previous disturbance from feral fauna activity (GHD, 2013b). Based on the GHD survey and DPaW advice, the north-eastern portion of the survey area that is in very good to excellent condition provides potential habitat for *Caladenia bryceana* subsp. *cracens*. This northern portion of the survey area has been excluded from the application area.

Twelve introduced flora species were identified during the flora survey (GHD, 2013b). Care must be taken to ensure that the proposed clearing activities do not introduce weed species to the non-infested areas. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Two broad fauna habitat types were recorded within the application area and these are found in similar condition in the local and regional area (GHD, 2013b).

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

Methodology

CALM (2002)
DPaW (2014)
GHD (2013b)
GIS Database:
- IBRA WA (Regions - Sub Regions)
- 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

A Level 1 fauna assessment of Mining Lease 70/968, including the application area, was undertaken by GHD ecologists and included an assessment of the likelihood of significant fauna and opportunistic records of fauna species and fauna habitats. The fauna field survey was undertaken in conjunction with the flora survey in August 2013 (GHD, 2013b).

Two broad habitat types were recorded within the application area:

- Mixed scrub on sandy soils with limestone; and
- Low heath on limestone hill (GHD, 2013b).

These habitat types are closely associated with vegetation in the application area and are found in similar condition in local and regional areas (GHD, 2013b). The application area forms part of a north-east to south-east habitat link, following the limestone escarpment present in the local and regional area. To the east is fragmented habitat associated with cleared agricultural areas and to the west is Hutt Lagoon (GHD, 2013b). The proposed clearing is not considered to fragment the existing linkage but it does reduce the width of the

wildlife corridor (GIS Database). It may also cause further edge effects.

Hutt Lagoon is a wetland of national significance due to its migratory bird population (DEC, 2009). The application area is geographically isolated from Hutt Lagoon and the proposed clearing is not expected to impact Hutt Lagoon (GHD, 2013b).

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

Methodology DEC (2009)
GHD (2013b)
GIS Database:
- Hutt 50 cm Orthomosaic - Landgate 2006
- NLWRA, Current Extent of Native Vegetation

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

Comments

Proposal may be at variance to this Principle

A flora and vegetation survey was undertaken by ecologists from GHD over Mining Lease 70/968, consisting of the application area and an adjacent area to the north-west. Desktop searches identified four Threatened Flora species that possibly occur within the survey area based on their occurrence within 10 kilometres and potential habitat types within the survey area. These species were:

- *Caladenia bryceana* subsp. *cracens*;
- *Caladenia hoffmanii*;
- *Drakaea concolor*; and
- *Pterostylis sinuata* (GHD, 2013b).

All four species are small, tuberous perennial orchids (Western Australian Herbarium, 2014). The species have all been recorded from the Geraldton Hills IBRA sub-region and Shire of Northampton, which is where the application area is located (Western Australia Herbarium, 2014).

Ecologists from GHD conducted the field survey in August 2013. No Threatened Flora was recorded during the survey (GHD, 2013b). However, no orchid species were recorded from the survey area (GHD, 2013b). The survey was undertaken at an appropriate time of the year which is within the known flowering period for each of the Threatened orchids. However, orchids often have short flowering times and are difficult to detect when not flowering. It is unusual that no orchids were flowering in August in that locality and this may indicate inadequate survey, poor winter rainfall resulting in poor/no flowering or the habitat being degraded (DPaW, 2014). In the three months prior to the survey the Kalbarri weather station received well below the average rainfall (GHD, 2013b).

Advice was received from the Department of Parks and Wildlife's (DPaW) orchid expert. DPaW advised that the upland, limestone habitat found in the survey area is not suitable for *Caladenia hoffmanii*, *Drakaea concolor* and *Pterostylis sinuata*. However, the survey area does contain suitable habitat for *Caladenia bryceana* subsp. *cracens* and this taxon could potentially occur within the survey area (DPaW, 2014).

The survey was undertaken during the flowering period of *Caladenia bryceana* subsp. *cracens* but given its small size (1-2 centimetres) it could be easily missed (DPaW, 2014). DPaW (2014) recommended that additional targeted surveys for the species, given its conservation status and lack of secure populations. The vegetation in very good to excellent condition would be the most likely areas to provide suitable habitat for the species (DPaW, 2014). The GHD survey identified the north-eastern portion of the survey area as very marginal habitat for the species, with some previous disturbance from feral fauna activity (GHD, 2013b). Based on the GHD survey and DPaW advice, the north-eastern portion of the survey area that is in very good to excellent condition provides potential habitat for *Caladenia bryceana* subsp. *cracens*. This northern portion of the survey area has been excluded from the application area. The vegetation in the application area, i.e. the southern portion, is mostly in completely degraded to good condition so it would provide poorer quality potential habitat for *Caladenia bryceana* subsp. *cracens*.

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

Methodology DPaW (2014)
GHD (2013b)
Western Australian Herbarium (2014)

(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

A search of available databases reveals that there are no Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest TEC is located approximately 185 kilometres south-east of the application area (GIS Database).

No TECs were identified during the flora and vegetation survey conducted by ecologists from GHD (2013b).

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

Methodology GHD (2013b)
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 likely to be at variance to this Principle

The application area falls within the Geraldton Sandplains IBRA bioregion (GIS Database). Approximately 44.9% of the pre-European vegetation in this bioregion remains (Government of Western Australia, 2013) which gives it a conservation status of 'Depleted' according to Department of Natural Resources and Environment (2002).

The vegetation in the application area is broadly mapped as Beard Vegetation Associations 17 and 371 (GIS Database):

17: Shrublands; *Acacia rostellifera* thicket; and
371: Low forest; *Acacia rostellifera*.

According to the Government of Western Australia (2013), approximately 88.3% of Beard Vegetation Association 17 remains at a state level while over 83% of pre-European vegetation remains in the bioregion and sub-region. This vegetation association would be given a conservation status of 'Least Concern' (Department of Natural Resources and Environment, 2002).

	Pre-European Area (ha)*	Current Extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves (and post clearing %)
IBRA Bioregion - Geraldton Sandplain	3,136,037	1,408,729	~44.9	Depleted	15.3 (34.1)
IBRA Subregion - Geraldton Hills	1,964,262	904,526	~46.1	Depleted	13.9 (30.1)
Local Government – Shire of Northampton	1,258,431	930,131	~73.9	Least Concern	14.7 (19.8)
Beard Vegetation Associations - State					
17	76,634	67,686	~88.3	Least Concern	7.5 (8.5)
371	32,816	3,499	~10.7	Vulnerable	0.9 (6.9)
Beard Vegetation Associations - Bioregion					
17	54,078	45,240	~83.7	Least Concern	10.7 (12.7)
371	32,808	3,499	~10.7	Vulnerable	0.9 (6.9)
Beard Vegetation Associations - Subregion					
17	49,605	42,020	~84.7	Least Concern	10.6 (12.5)
371	32,808	3499	~10.7	Vulnerable	0. 9 (6.9)

* Government of Western Australia (2013)
** Department of Natural Resources and Environment (2002)

Beard Vegetation Association 371 has approximately 10.7% remaining with its current extent and this would be given a conservation status of 'Vulnerable' (Department of Natural Resources and Environment, 2002; Government of Western Australia, 2013). A vegetation and flora survey by GHD ecologists mapped vegetation types in Mining Lease 70/968 at a much finer scale than the Beard vegetation mapping. A total of five vegetation types were recorded from the survey area of which Vegetation Type 2 *'Acacia rostellifera* scrub' is similar to Beard Vegetation Association 371 (GHD, 2013b). Vegetation Type 2 was mapped in the middle of Mining Lease 70/968 (GHD, 2013b) and excluded from the application area (GMA Garnet Pty Ltd, 2014). Therefore there will not be a reduction in Beard Vegetation Association 371 as it does not occur in the application area.

The application area forms part of an ecological linkage running north-west to south-east with Hutt Lagoon to the east and large areas of cleared farmland to the west (GIS Database). The proposed clearing partially disrupts the linkage and exposes the remaining vegetation to increased edge effects. Potential impacts to adjacent remnant vegetation as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

GMA Garnet Pty Ltd will be progressively rehabilitating cleared areas with the post-mining land use a return to native vegetation. The rehabilitation requirements are under the *Mining Act 1978* and rehabilitation procedures are detailed in the project Mining Proposal and Mine Closure Plan (GHD, 2013c).

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

Methodology

Department of Natural Resources and Environment (2002)
GHD (2013b)
GHD (2013c)
GMA Garnet Pty Ltd (2014)
Government of Western Australia (2013)
GIS Database:
- Hutt 50 cm Orthomosaic - Landgate 2006
- IBRA WA (Regions - Subregions)
- NLWRA, Current Extent of Native 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 not likely to be at variance to this Principle

According to available databases, there are no permanent watercourses or wetlands within the application area. There are several minor non-perennial watercourses previously mapped as crossing the application area (GIS Database) but these were not detected during the field survey by ecologists from GHD (2013b).

The flora and vegetation survey by ecologists from GHD (2013b) identified three vegetation types within the application area and none of them were described as having an association with a watercourse or wetland (GHD, 2013b).

The application area is approximately 850 metres east of Hutt Lagoon, a wetland listed in the Directory of Important Wetlands in Australia as an important stop-over for migratory waterbirds and a good example of a coastal brine lake (Department of the Environment, 2014; GIS Database). Hutt Lagoon is a macroscale elongate sumpland aligned north-west to south-east, parallel to the coast and it contains a large series of artificial ponds used to farm the algae *Dunaliella salina* (DEC, 2009). The vegetation of Hutt Lagoon consists of low samphire shrublands in periform or latiform arrangement, with sedgeland present at seepage sites. The surrounding areas support open heathland which includes River Red Gum (*Eucalyptus camaldulensis*) (Jaensch, 1992 as cited in DEC, 2009).

The existing garnet mine east of Hutt Lagoon is described as a threat to the ecology of Hutt Lagoon in DEC's Resource Condition Report because of its potential to alter the hydrology and water quality of Hutt Lagoon if not managed properly (DEC, 2009). The proposed clearing is to expand the existing garnet mine to the east of existing operations (GHD, 2013c). The threats of the garnet operations are focussed on operational aspects of groundwater use with groundwater draw down potentially causing a seawater intrusion and impacting nearby Utcha Swamp (DEC, 2009). Groundwater management during operations is assessed in the Mining Proposal under the *Mining Act 1978*. The proposed clearing of up to 5 hectares per year with progressive rehabilitation is unlikely to impact the vegetation of Hutt Lagoon.

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

Methodology

DEC (2009)
Department of the Environment (2014)
GHD (2013b)
GHD (2013c)
GIS Database:
- ANCA, Wetlands
- 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 at variance to this Principle

According to available databases, there is one soil type (B26) within the application area (GIS Database). This soil type is described as an undulating dune landscape underlain by aeolianite which is exposed in places. The chief soils are siliceous sands with some shallow grey-brown sandy soils.

During summer average wind speeds of 21.9 kilometres/hour prevail from the north-east and south-east in the morning, before shifting to the south and south-west in the afternoon. During the winter months winds abate to an average of generally less than 14.4 kilometres/hour, with less distinctive wind patterns. The combination of high wind speeds and high temperatures during summer produces elevated evaporation rates, with high potential for dust lift off from non-vegetated areas during dry, windy conditions (Bureau of Meteorology, 2013 cited in GHD, 2013b). The deep sands of the area have a high to very high wind erosion risk (GHD, 2013a). GMA Garnet Pty Ltd's current practise is to clear vegetation just prior to winter and not clear vegetation in summer (GHD, 2013a).

Before clearing, vegetation is removed using a raised blade technique. Pre-winter clearing allows rain to wash into the soil, preserving root stock and encourages grass cover on the soil surface, which binds the soil. This controls erosion until mining commences (GHD, 2013a).

The Australian Soil Resource Information System indicated that there is an extremely low probability of acid sulphate soils occurring in the application area (GHD, 2013b).

Based on the above, the proposed clearing is at variance to this Principle. However, the clearing procedures and wind erosion management by GMA Garnet Pty Ltd will counterbalance the risk.

Methodology

GHD (2013a)
GHD (2013b)
GIS Database:
- Soils, Statewide

(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 within conservation estate (GIS Database). The closest conversation estate area to the application is Utcha Nature Reserve, which is approximately 7.5 kilometres to the north-west (GIS Database). It is not expected that the proposed clearing will have any impact on this area.

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

Methodology

GIS Database:
- DEC Tenure

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

Comments

Proposal is not likely to be at variance to this Principle

According to available databases, there are no permanent watercourses or wetlands within the application area. There are several minor non-perennial watercourses previously mapped as crossing the application area (GIS Database) but these were not detected during the field survey by ecologists from GHD (2013b).

Little, if any, surface run-off occurs in the application area. Any rainfall infiltrates rapidly through the porous sand and limestone to groundwater (GHD, 2013c).

The application area is not located within a Public Drinking Water Source Area (PDWSA). The nearest PDWSA is Port Gregory Water Reserve, located approximately 800 metres east of the application area (GIS Database).

The moderate amount of clearing (5 hectares per year) is unlikely to cause deterioration in the quality of surface or groundwater.

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

Methodology

GHD (2013b)
GHD (2013c)
GIS Database:
- Hydrography, Linear
- Public Drinking Water Source Areas (PDWSAs)

(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 within the Coastal catchment of the Greenough River Basin (GIS Database). Given the size of the area to be cleared (30 hectares) in relation to the size of the catchment area (92,059 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a catchment scale.

Major flooding does not occur often in the Northern Agricultural region (DEC, 2009) and the application area occurs on sandy soils which are not prevalent to flooding events (GHD, 2013a). Therefore the proposed clearing is not likely to increase the potential of flooding at a local scale.

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

Methodology

DEC (2009)
GHD (2013a)
GIS Database:
- Hydrographic Catchments - Catchments

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

Comments

The clearing permit application was advertised on 20 January 2014 by the Department of Mines and Petroleum inviting submissions from the public. One submission was received about Aboriginal heritage and cumulative impacts of clearing. A response was sent and cumulative impacts of clearing are assessed in Principle (e).

There is one Native Title Claim (WC2000/001) 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 no registered Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Environment Regulation, Department of Parks and Wildlife 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.

Methodology

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

4. References

CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Geraldton Sandplain 3 (GS3 - Lesueur Sandplain Subregion). Department of Conservation and Land Management, Western Australia.

DEC (2009) Resource Condition Report for a Significant Western Australian Wetland - Hutt Lagoon. Department of Environment and Conservation, Perth, 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.

Department of the Environment (2014) Directory of Important Wetlands in Australia - Information Sheet. http://www.environment.gov.au/cgi-bin/wetlands/report.pl Accessed 25 February 2014.

DoW (2014) Advice to Assessing Officer for Mining Proposal Reg ID 45369. Department of Water, Midwest Gascoyne Region, February 2014.

DPaW (2014) Advice to Assessing Officer for Clearing Permit Application CPS 5947/1. Department of Parks and Wildlife, Species and Communities Branch, March 2014.

GHD (2013a) GMA Port Gregory Mine Tenement M70/968 Supporting Document for Clearing Permit Application. Report Prepared by GHD for GMA Garnet Pty Ltd, October 2013.

GHD (2013b) GMA Port Gregory Mine Tenement M70/968 Vegetation, Flora and Fauna Assessment. Report Prepared by GHD for GMA Garnet Pty Ltd, October 2013.

GHD (2013c) Lynton Mine Extension M70/968 Mining Proposal. Report Prepared by GHD for GMA Garnet Pty Ltd, December 2013.

GMA Garnet Pty Ltd (2014) Correspondence to the Assessing Officer. March 2014.

Government of Western Australia (2013) 2012 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). WA Department of Environment and Conservation, Perth.

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

Western Australian Herbarium (2014) FloraBase - the Western Australian Flora. Department of Parks and Wildlife. http://florabase.dpaw.wa.gov.au/.

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.