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

# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

**Permit application No.:** 4086/1
**Permit type:** Purpose Permit

### 1.2. Proponent details

**Proponent's name:** **VW & DJ Corps**

### 1.3. Property details

**Property:** Mining Lease 47/1415
Miscellaneous Licence 47/344
**Local Government Area:** Shire of Roebourne
**Colloquial name:** Maitland River Sand Mining

### 1.4. Application

| Clearing Area (ha) | No. Trees | Method of Clearing | For the purpose of: |
|---|---|---|---|
| 10.64 | | Mechanical Removal | Sand mining and associated activities |

### 1.5. Decision on application

**Decision on Permit Application:** Grant
**Decision Date:** 24 February 2011

## 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:<br>127 (Bare areas mudflats); and<br>175 (Abydos Plain: Short bunch grassland - savanna/grass plain).<br><br>Astron (2010) described the vegetation of the application area as comprising ten vegetation associations within the following eight broad floristic formations:<br>1. Open *Scleroleana hostilis* shrubland over tussock grassland on saline scalds of coastal flat.<br>2. *Atriplex bunburyana* open shrubland over tussock grassland on remnant coastal dune.<br>3.Samphire dwarf shrubland on saline flats<br>4. Samphire dwarf shrubland over mixed tussock grassland on saline flats.<br>5. *Triodia ?longiceps* open hummock grassland over tussock grassland on lower slope of coastal dune.<br>6. Scattered Acacia over *Triodia epactia* hummock grassland on remnant coastal dune.<br>7. *Acacia coriacea* shrubland over mixed shrubs and tussock grassland on steep coastal dune.<br>8. *Corchorus walcottii* open dwarf shrubland over tussock grassland on coastal dune. | VW and DJ Corps of Karratha Earthmoving propose to clear up to 10.64 hectares of native vegetation within an application area of approximately 132 hectares (GIS Database). The application area is located approximately 30 km south west of Karratha near the mouth of the Maitland River (GIS Database).<br><br>The proposed clearing is for sand mining and associated infrastructure on M47/1415 and an access road on L47/344 (Karratha Earthmoving, 2010). | Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).<br><br>To<br><br>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994). | The vegetation condition and description is based on the flora and vegetation survey conducted by Astron (2010). This was assessed utilising the vegetation condition scale used for the Pilbara and was converted to the Keighery scale for consistency. |

## 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 Roebourne sub-region of the Pilbara Interim Biogeographic Regionalisation of Australia bioregion (GIS Database). This sub-region is characterised as quaternary alluvial and older colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera*. Uplands are dominated by *Triodia hummock* grasslands. Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Samphire, Sporobolus and mangal occur on marine alluvial flats and river deltas (CALM, 2002).

Several flora and fauna studies (Astron, 2010; Mattiske, 2009 and Ninox, 2009) have been conducted over the application area. These involved both desktop studies and field surveys. The database search recorded ten Priority Flora species as potentially occurring within the application area (Mattiske, 2009).

During the Astron June 2010 flora and vegetation survey a total of 39 taxa representing 15 families and 30 genera were recorded within the application area (Astron, 2010). The most commonly represented families included Chenopodiaceae (12 species) and Poaceae (8 species) (Astron, 2010). Of these, no Declared Rare Flora or Priority flora species were recorded within the application area.

During the flora and vegetation survey, four species from the Tecticornia genera that are currently under Department of Environment and Conservation's (DEC) taxonomic review were recorded from the saline flats in the application area. There is the potential for new species to be described, particularly so for the *Tecticornia halocnemoides* group (Astron, 2010), and it is not known if these species are recorded outside of the application area in both the local area and throughout the Roebourne subregion. The presence of Tecticornia species within the application area raises the diversity of the area from a floristic perspective as they may potentially be significant species. Potential impacts to the undescribed Tecticornia spp. may be minimised by the implementation of a flora management condition.

The conditions for the flora and vegetation survey were not conducive to sampling ephemeral or annual species. As a result annual species had senesced and ephemerals were absent (Astron, 2010). Of the ten Priority Flora species listed by Mattiske (2009) as having been recorded within 20 km of the six Karratha Earthmoving tenements, there is potential for the short lived annual species *Atriplex lindleyi* subsp. *conduplicata* (P3) to occur within the saline scalds of L 47/344 (Astron, 2010). In addition, the perennial or herb species *Stackhousia clementii* (P3) may also occur in the application area as it has been recorded in hummock grassland within the region (Astron, 2010). Both species have wide distributions (Western Australian Herbarium, 1998), therefore it is unlikely that the conservation status of these species would be impacted by the proposed clearing.

Of the ten vegetation associations identified within the application area, seven were predominantly dunal associations (Astron, 2010). These associations were dominated by the weed species: Buffel Grass (*Cenchrus ciliaris*) and/or Kapok (*Aerva javanica*) and are largely degraded as a result (Astron, 2010). Neither of these weed species are listed as Declared Plants under the *Agriculture and Related Resources Protection Act, 1976*, however the presence of weeds has the potential to reduce the biodiversity of an area. Care should be taken to ensure that weeds are not spread as a result of the proposed clearing. Potential impacts may be minimised by the implementation of a weed management condition.

The application area falls within the buffer zone of the 'Horseflat Land System' Priority Ecological Community (PEC) (GIS Database). This is characterised as gilgaied clay plains supporting tussock grasslands (Payne and Tille, 1992). During the Astron flora and vegetation survey (2010) no vegetation associations analogous with this PEC were recorded within the application area (Astron, 2010).

From a fauna perspective, the Ninox (2009) desktop study identified a number of vertebrate fauna species of conservation significance with the potential to occur in the application area. Based on habitat assessment, Astron (2010) refined this, and reported that a potential of six bird, two mammal and two reptile species could occur within the application area. These species are highly mobile with representative habitats outside of the proposed clearing. The application area consists of coastal sand dunes and saline mud-flats and is unlikely to represent higher biological diversity than surrounding similar areas.

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

**Methodology**

CALM (2002)
Astron (2010)
Mattiske (2009)
Ninox (2009)
Payne and Tille (1992)
Western Australian Herbarium (1998)
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 is not likely to be at variance to this Principle**

Ninox conducted a desktop fauna study of Karratha Earthmoving's six tenements in 2009. This was then followed by Astron's 2010 flora and fauna reconnaissance survey of the six tenements. Two of these tenements included the application area.

The following broad habitats were identified within the application area during the reconnaissance survey:
-Coastal dunes;
-Samphire flats;
-Coastal flats with saline scalds; and
-Sandy island (remnant coastal dune) on Samphire flat.

The tidal inlet within the south south-west corner of M47/1415 supports a low mangrove forest. Mangroves of the Roebourne IBRA subregion in which the application area is located are recognised as having sub-regional significance because they provide habitat for conservation significant birds such as the Great Egret (Ardea alba) and the Eastern Reef Heron (*Ardea sacra*) (Ninox, 2009). In addition, there is also potential for other fauna of conservation significance to occur, such as the Mangrove Sea Snake (*Ephalophis greya*), Black-ringed Sea Snake (*Hydrelaps darwiniensis*) and Little Northern Freetail bat (*Mormopterus loriae coburgensis*) (Ninox, 2009). The mangrove area is located approximately 820 metres south west from the application area (at its nearest point). Karratha Earthmoving (2010) has indicated there will be no impact to the mangrove habitats and have outlined mitigation measures to prevent injuries or death to fauna.

Astron (2010) identified six bird, two mammal and two reptile species of conservation significance considered likely to utilise the habitats in the application area. These were:

Oriental Cuckoo (*Cuculus saturates*)
Wedge tailed Shearwater (*Puffinus pacificus*)
Great Egret (*Ardea alba*)
Eastern Reef Heron (*Ardea sacra*)
White bellied Sea Eagle (*Haliaeetus leucogaster*)
Little Northern Freetail bat (*Mormopterus loriae coburgensis*)
Short tailed Mouse (*Leggadina lakedownensis*)
Mangrove Sea Snake (*Ephalophis greyae*)
Black ringed Sea Snake (*Hydrelaps darwiniensis*)

Most birds and larger animals such as kangaroos, wallabies and some reptiles are highly mobile and are able to move away from disturbance. However, smaller, ground-dwelling species are resident and may have specific habitat requirements; their ability to move is limited because of their small size. Disturbance of these fauna habitats may have a detrimental, but predominantly localised, effect on some vertebrate fauna species (Karratha Earthmoving, 2010).

The application area falls within three land systems (GIS Database), the majority of which is within the Littoral Land System which accounts for 7% or 718 square kilometres of the Roebourne Plains area Payne and Tille, 1992. The application area also contains the Cheerawarra Land System which accounts for 2.7% or 273 square kilometres of the Roebourne Plains area (Payne and Tille, 1992). A small section in the south section of the application area also falls within the Horseflat Land System, this accounts for 19.6% or 1,998 square kilometres of the Roebourne Plains area (Payne and Tille, 1992). Therefore the vegetation associations and fauna habitats recorded within the application area are well represented within the broader region and the proposed clearing is not likely to have any significant impact on fauna habitats in a regional context.

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

**Methodology**

Astron (2010)
Karratha Earthmoving (2010)
Ninox (2009)
Payne and Tille (1992)
GIS Database:
- Rangeland Land System Mapping

**(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**

Astron (2010) conducted flora and vegetation surveys in June 2010 of an area totalling approximately 265.6 hectares over the tenements M47/1415 and L47/344 located within the application area, No Declared Rare Flora (DRF) were recorded during the survey (Astron, 2010). There are no historic records of DRF occurring within the application area and none would be expected to occur (Astron, 2010) (GIS Database).

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

**Methodology** Astron (2010)
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**
No Threatened Ecological Communities (TECs) are located within the application area (GIS Database).

Astron (2010) mapped ten vegetation associations as occurring within the application area during the flora and vegetation survey. None of the vegetation types identified represent TECs listed under the *Environment Protection and Biodiversity Conservation Act 1999,* or by the Department of Environment and Conservation (Astron, 2010).

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

**Methodology** Astron (2010)
GIS Database:
- Threatened Ecological Sites Buffered

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

**Comments** **Proposal is not at variance to this Principle**
The application area is located within the Pilbara bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Shepherd (2009) reported that approximately 99.9% of the pre-European vegetation remains in the Pilbara bioregion. The vegetation in the application areas is broadly mapped as Beard vegetation associations:
127: Bare areas mudflats; and
175: Abydos Plain: Short bunch grassland - savanna/grass plain.

According to the Department of Natural Resources and Environment (2002) both of these Beard vegetation associations are classed as 'Least Concern' such that more than 50% of pre-European vegetation exists and is subject to little or no degradation over a majority of this area (see table below).

| | Pre-European area (ha)* | Current extent (ha)* | Remaining %* | Conservation Status** | Pre-European % in IUCN Class I-IV Reserves (and post clearing %) |
|---|---|---|---|---|---|
| IBRA Bioregion - Pilbara | 17,804,193 | 17,785,000 | ~99.9 | Least Concern | 6.3 (6.27) |
| IBRA Subregion - Roebourne | 1,844,157 | 1,825,336 | ~98.98 | Least Concern | 3.15 (2.69) |
| Beard vegetation associations - WA | | | | | |
| 127 | 742,643 | 717,068 | ~96.56 | Least Concern | 7.99 (7.90) |
| 175 | 526,206 | 524,861 | ~99.74 | Least Concern | 4.22 (4.23) |
| Beard vegetation associations - Bioregion | | | | | |
| 127 | 180,401 | 177,739 | ~98.52 | Least Concern | 0 |
| 175 | 507,035 | 507,006 | ~99.99 | Least Concern | 4.38 (4.38) |
| Beard vegetation associations - subregion | | | | | |
| 127 | 179,949 | 177,287 | ~98.52 | Least Concern | 0 |
| 175 | 116,338 | 116,308 | ~99.97 | Least Concern | 0 |

* Shepherd (2009)

** Department of Natural Resources and Environment (2002)

The vegetation under application is not a remnant of native vegetation in an area that has been extensively cleared.

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

**Methodology** Department of Natural Resources and Environment (2002)
Shepherd (2009)
GIS Database:
- IBRA WA (Regions-Sub-regions)
- Pre-European Vegetation

**(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.**

**Comments** **Proposal may be at variance to this Principle**
There are no permanent freshwater watercourses or wetlands within the application area. The proposed access track crosses saline mud flats that are subject to inundation and support samphire vegetation communities (Astron, 2010; GIS Database).

The construction of an access track across the samphire flats within L 47/344 may impede tidal flow and impact the samphire vegetation. Karratha Earthmoving (2010) has advised that culverts will be installed to maintain water flow pathways across the saline flats, minimising impacts to the samphire vegetation communities.

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

**Methodology** Astron (2010)
Karratha Earthmoving (2010)
GIS Database:
- Hydrography, linear

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

**Comments** **Proposal may be at variance to this Principle**
The application area intersects the Littoral, Cheerawarra, and Horseflat Land Systems (GIS Database).

The majority of the application area falls within the Littoral Land System which is characterised by extensive bare coastal mudflats flanked by mangroves and samphire flats with quaternary coastal mud and silty loams, minor sandy islands, narrow sandy plains, coastal dunes and beaches with Aeolian sands (Payne and Tille, 1992). This land system is not susceptible to soil erosion however is highly susceptible to wind erosion if vegetative cover is depleted (Payne and Tille, 1992).

The Cheerawarra Land System is characterised by sandy coastal plains and saline clay plains supporting soft and hard spinifex grasslands and minor tussock grasslands (Payne and Tille, 1992). Most units of this land system are highly susceptible to wind erosion if vegetative cover is depleted (Payne and Tille, 1992).

A small section of the application area in the south eastern corner falls within the Horseflat Land System. This is comprised of gilgaied clay plains supporting tussock grasslands (Payne and Tille, 1992). Parts of this land system are moderately to highly susceptible to erosion if vegetation is depleted, though other units with clay soils and stony mantles are inherently resistant (Payne and Tille, 1992).

The application area intercepts areas categorised as 'high' to 'moderate' Acid Sulphate Soil (ASS) risk (GIS Database). Karratha Earthmoving (2010) reported that the resource contains no sulphidic material likely to form acid on exposure to air, so that acid mine drainage risks are non-existent. The resource is strongly oxidised, slightly calcareous, less than 10,000 years old (post-Holocene) and containing little or no organic matter which, even if soil conditions were anaerobic, could produce acid-sulphate deposits (Karratha Earthmoving, 2010). On this basis, the proposed clearing activities are not likely to pose a significant ASS risk.

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

**Methodology** Karratha Earthmoving (2010)
Payne and Tille (1992)
GIS Database:
- Acid Sulfate Soil Risk Map, Pilbara Coastline
- Rangeland Land System Mapping

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

**Comments**

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

The application area is located approximately 300 metres from the coastline. Several Department of Environment and Conservation (DEC) managed Nature Reserves are located on near shore islands along this section of the coast. The nearest of which are approximately 14 kilometres north and 21 kilometres north east of the application area (GIS Database). The application area is located within the Karratha station which is proposed to be managed by DEC in 2015 and is located (GIS Database). The application area is also located 13 kilometres north west from the DEC managed Mardie Station (GIS Database). These conservation areas are not likely to be impacted by the proposed clearing.

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

**Methodology**

GIS Database:
- DEC Tenure
- DEC Proposed 2015 Pastoral Lease Exclusions

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

**Comments**

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

The application area is not located within a Public Drinking Water Source Area (GIS Database). The application area is situated partly on saline coastal flats which are subject to inundation (GIS Database). High sediments loads may enter the tidal areas from overland flow events which result following significant rainfall events. The proposed clearing is not likely to significantly increase sediment entering the tidal areas or Indian Ocean.

With an average annual rainfall of approximately 300 millimetres (BOM, 2010) and an annual evaporation rate of 3,400 millimetres (GIS Database) there is little surface flow during normal seasonal rains. The sand dunes are highly permeable with sparsely distributed vegetation, so the proposed clearing is not likely to increase surface water run-off.

With high annual evaporation rates and low annual rainfall there is little recharge into regional groundwater, that at this site is considered brackish (between 1,000 milligrams/litre and 3,000 milligrams/litre) (GIS database).

The proposed clearing of up to 10.64 hectares of sand dunes and mud flat vegetation is unlikely to have any impact on groundwater or surface water quality.

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

**Methodology**

BOM (2010)
GIS Database:
- Evaporation Isopleths
- 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 within the Maitland River Catchment Area which covers a total area of approximately 4,600 hectares (GIS Database). The application area is located on coastal sand dunes and saline flats. Clearing of vegetation on the highly permeable sand dunes is unlikely to cause or exacerbate flooding.

The proposed clearing of the dune could potentially cause movement of inland sediment during king tides, flooding of the Maitland River and when combined with cyclonic activity the potential to impact the mangrove system. Karratha Earthmoving (2010) has stated that the proposed mining will occur behind the primary dune and will be the third dune back from the ocean. This complies with the advice provided by the EPA (2010) which recommended that complete removal of the dune system be avoided.

The access road is proposed to be constructed across the mudflats within L47/344. This has the potential to impede tidal flow and impact on samphire vegetation. Karratha Earthmoving (2010) advised that the design of the causeway will take into account the level of water associated with the tides and the level of the 1 in 100 year storm surge (6.2m AHD).

The causeway will be built across the highest area of the mudflats and between sand islands that are located in the flats. The use of high points and existing islands will ensure that the mudflats have the same conditions that they experience now (Karratha Earthmoving, 2010). Culverts will be used to prevent pooling and ensure continual surface water flows across the mudflats (Karratha Earthmoving, 2010).

Given the mitigation methods proposed to minimise changes in tidal flows across the mudflats the proposed clearing is not likely to 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** Karratha Earthmoving (2010)
GIS Database:
- Hydrographic Catchments - Catchments
- Rivers

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

**Comments**

There is one native title claim over the application area; WC96/89. This claim has been registered with the Native Title Tribunal on behalf of the claimant group (GIS Database). In addition there is also one Native Title Determined WC99/14. 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 Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Environment and Conservation (DEC) 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 sand mining proposal was originally referred to the Environmental Protection Authority (EPA). The EPA set the level of assessment as: "Not Assessed – Public Advice Given."

The Public Advice recommended the following:

Removal of the whole dune should be avoided to prevent potential impacts to the Mangrove system;
Tecticornia species should be avoided;
The proponent should liaise with the DEC to ensure that conservation significant fauna in the project area are protected; and
Culverts should be included within the access road across the samphire flats to prevent impacts to the samphire vegetation and impediment of tidal flow (EPA, 2010).

The clearing permit application was advertised on 13 December 2010 by the Department of Mines and Petroleum, inviting submissions from the public. No submissions were received in relation to this application.

**Methodology** EPA (2010)
GIS Database:
- Native Title Determined
- Native Title Federal
- Native Title NNTT
- Sites of Aboriginal Significance

## 4. References


Astron (2010) Karratha Earthmoving Tenement M47/1415 Vegetation, Flora and Fauna Survey. Prepared for Karratha Earthmoving, June 2010. Astron Environmental Services, Karratha.

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Ninox (2010) A Level 1 Vertebrate Fauna Assessment of Tenements M47/1412, M47/1415, M47/1420, M47/796, M47/1405 and L47/233 near Karratha. Report prepared for John Consulting Services on behalf of Karratha Earthmoving, April

2009.
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Shepherd (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.
Western Australian Herbarium (1998) Florabase - The Western Australian Flora. Department of Environment and Conservation. http://florabase.calm.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.