



## 1. Application details

### 1.1. Permit application details

Permit application No.: 2837/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: BHP Billiton Nickel West Pty Ltd

### 1.3. Property details

Property:  
Mining Lease 53/489  
Mining Lease 53/218  
Mining Lease 53/166  
Mining Lease 53/165  
Mining Lease 53/56  
Mining Lease 53/57  
Local Government Area: Shire Of Wiluna  
Colloquial name: Mt Keith Nickel Operation

### 1.4. Application

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

## 2. Site Information

### 2.1. Existing environment and information

#### 2.1.1. Description of the native vegetation under application

##### Vegetation Description

The area applied to clear has been broadly mapped at a scale of 1:250,000 as: Beard Vegetation Association 39: shrublands; mulga scrub (Shepherd et al, 2001).

Landcare Services undertook a habitat mapping program of the Mt Keith Operations (MKO) from the 19 August 1996 to the 2 September 1996. The methods utilised in the project included aerial photography and ground truthing (Landcare Service, 1997). In addition, Western Botanical performed a flora and vegetation survey of the area in August 2006 and provided comment upon the proposed project and its impacts on flora and vegetation in September 2008. Western Botanical (2008) identified the following five vegetation communities within the application area:

#### 1) Drainage Tract Mulga Shrublands (DRMS)

Areas of moderately close to closed Mulga shrublands in narrow non-incised drainage tracts which originate in the Barr-Smith Range to the west of the MKO.

#### 2) Hardpan Mulga Shrublands (HPMS)

This unit supports tall, open to moderately close shrublands of Mulga (*Acacia aneura*), *Acacia tetragonophylla* and *Hakea lorea* with an understorey usually devoid of grasses and dominated by *Eremophila spectabilis*. HPMS often fringes the more densely vegetated DRMS communities.

#### 3) Loamy Plains (PLMS)

This unit supports Mulga (*Acacia aneura*), *Acacia tetragonophylla* and substantial grass understorey, often represents alluvial fans and low energy environments associated with drainage lines.

#### 4) Stony Acacia - Eremophila shrublands (SAES)

This unit supports very scattered *Eremophila galeata* to 2m and occasional *Acacia aneura* shrubs to 3m on stony plain.

#### 5) Wanderrie Bank Grassy Shrublands (WABS)

##### Clearing Description

BHP Billiton Nickel West Pty Ltd (BHP Billiton) has proposed to clear up to 118ha of native vegetation within an application area of approximately 585ha (GIS Database). The proposed clearing is located approximately 75km south-east of Wiluna (GIS Database).

The purpose of the proposed clearing is mineral production. BHP Billiton (2008), propose to clear for the construction of an all-weather access road, security building (gate house) and a drain. Vegetation clearing will be undertaken by mechanical means and the topsoil and vegetation will be stockpiled for rehabilitation purposes (BHP Billiton, 2008).

##### Vegetation Condition

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

To

Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).

##### Comment

The vegetation condition rating is based on the clearing vegetation report by BHP Billiton (2008). BHP Billiton (2008) state that previous pastoral activity has caused heavy land degradation in the region due to clearing and grazing, which has led to extensive vegetation loss and severe erosion in some areas.

This unit consists of sparse perennial grasslands of *Eragrostis eriopoda* with occasional emergent *Eremophila* and *Acacia aneura* shrubs.

### 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 area is located within the East Murchison subregion of the Murchison Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). This region is characterised by internal drainage and extensive areas of elevated red desert sandplains with minimal dune development (CALM, 2002). The vegetation is dominated by Mulga woodlands often rich in ephemerals; hummock grasslands, saltbush and *Halosarcia shrublands* (CALM, 2002) and this is reflected within the application area which has a high predominance of Mulga shrublands.

Landcare Services (1997) conducted a habitat mapping program of the MKO area and Western Botanical performed a summarisation of this assessment in September 2008 in relation to the current application. Landcare Services (1997) reported a total of 101 flora species within the survey area and Western Botanical (2008) identified five vegetation units that would occur within the application area.

The application area is described as being fairly degraded, primarily due to previous pastoral clearing and grazing activity (BHP Billiton, 2008) as well as previous mining activities. Due to this there has been some weed infestation across the minesite with two weed species having been previously recorded; Prickly Paddy Melon (*Cucumis myriocarpus*) and Ruby Dock (*Acetosa vesicarius*) (Western Botanical, 2006). The presence of introduced flora species would lower the biodiversity value of the application area and therefore, care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. Should a clearing permit be granted, it is recommended that a condition be imposed for the purposes of weed management.

Biota Environmental Sciences conducted a fauna survey of the application area and adjacent areas in mid-March 2006. This search identified a total of 106 vertebrate fauna species representing 39 families that could potentially occur within the survey area (Biota, 2006). This tally comprised four frogs, 32 reptiles, 56 birds and nine non-volant mammals (Biota, 2006).

The landforms, vegetation and habitat types occurring within the application area are well represented within the surrounding region (BHP Billiton, 2008; Shepherd et al, 2001). Given the past disturbances within the application area such as weeds, grazing and mining, the vegetation within the application area is not likely to represent an area of high biodiversity.

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

**Methodology**      BHP Billiton (2008)  
Biota (2006)  
CALM (2002)  
Landcare Services (1997)  
Shepherd et al. (2001)  
Western Botanical (2006)  
Western Botanical (2008)  
GIS Database  
- Interim Biogeographic Regionalisation of Australia (IBRA)

#### (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**

Biota Environmental Sciences performed a fauna survey of the application area and adjacent areas in March 2006. This survey complies with the Environmental Protection Authority (EPA) Position Statement No. 3 *Terrestrial Biological Surveys as an Element of Biodiversity Protection* (EPA, 2002) and Guidance Statement No. 56 *Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia* (EPA, 2004). The principle element of this survey comprised 13 trapping grids in habitats considered to represent the range available within the study area (Biota, 2006).

Biota (2006) identified the following habitat units within the application area:

- Hardpan Mulga Shrublands (HPMS).
- Drainage Tract Mulga Shrublands/Woodlands (DRMS).
- Wanderrie Bank Grassy Shrublands (WABS).
- Scattered *Acacia* – *Eremophila* Shrublands (SAES).

The minor drainage features (DRMS) associated with the Monk Land System and located immediately north of the accommodation buildings are considered to have a moderate conservation value as they provide a landscape function role beyond the confines of the vegetation unit itself (Biota, 2006). In addition, Craig and Chapman (2003), as cited in Biota (2006) have suggested that mulga groves may in fact act as refugia during climatically harsh periods and reiterated the opinion that degradation of these drought refugia may compromise the local persistence of species dependent on them (though he referred only to mammals). Craig and Chapman (2003) as cited in Biota (2006) suggest in relation to arid-zone management avifauna conservation that 'there should be a strong focus in arid-zone management to conserve areas of groving and creekline mulga'. While the authors of Biota (2006) agree with the general sentiment, they note that the conservation of the mulga communities requires that the specific catchments are also conserved and the processes of drainage are not interrupted. The drainage within the MKO area has already been significantly altered and therefore, the conservation value of mulga groves in the vicinity is likely to have been compromised.

Within the application area several fauna species of conservation significance have the potential to occur. The conservation significant fauna most likely to occur within the application area are:

- Mulgara (*Dasyercus cristicauda*) – Schedule 1 (Fauna that is rare or likely to become extinct), *Wildlife Conservation (Specially Protected Fauna) Notice 2008*.
- Princess Parrot (*Polytelis alexandrae*) – Priority 4 on the Department of Environment and Conservation's (DEC) Threatened and Priority Fauna list.
- Malleefowl (*Leipoa ocellata*) – Schedule 1 (Fauna that is rare or likely to become extinct), *Wildlife Conservation (Specially Protected Fauna) Notice 2008*.
- Rainbow Bee-eater (*Merops ornatus*) – Marine and Migratory (*Environmental Protection and Biodiversity Conservation (EPBC) Act 1999* and Japan-Australia Migratory Bird Agreement (JAMBA)).

The Mulgara prefers habitat comprising largely immature hummock grassland, particularly where this coincides with better watered areas such as drainage lines in sandplain or sand-dune habitat (Maxwell, 1996 as cited in Biota, 2006). The Mulgara was trapped during the Biota survey (Biota, 2006), in one location outside of the application area. The habitat at this site is described as Bullimore Land System - Sandplain Mulga Spinifex Shrublands (SAMU) on Loamy Plain. This land system occurs extensively throughout the region (Biota, 2006). The Draft Recovery Plan, 2005-2009 for the Mulgara states that it is relatively secure in its range, and recovery actions focus on the clarification of its status (Masters, 2005 in Biota, 2006). Given the large area of habitat within the region that the Mulgara can utilise, and that SAMU vegetation is not identified within the application area, the vegetation within the application area is not likely to be significant habitat for this species.

The Princess Parrots' preferred habitat consists of swales between sand dunes where they feed on a variety of seeds, as well as flowers, fruits and foliage of shrubs and trees (Higgins, 1999). Nests have been recorded in hollows of River Red Gum (*Eucalyptus camaldulensis*) and Desert Oak (*Allocasuarina decaisneana*) (Higgins, 1999). Coffey Environments (2008) have reported recently seeing this species in the Wanjarri Nature Reserve located approximately 4km south-east of the application area. The species may be a sporadic visitor to the area, and there is a vast amount of vegetation it could utilise for feeding within the local area. The application area is not likely to represent significant habitat for this species.

The Malleefowl is largely confined to arid and semi-arid woodland that is dominated by Mallee Eucalypts on sandy soils, with less than 430 millimetres of rainfall annually (DEC, 2009). They may also be found in Mulga (*Acacia aneura*), and other sclerophyllous associations (DEC, 2009). They require sandy soils with an abundance of leaf litter for breeding. The species has been recorded at Mt Keith and nearby Wanjarri Nature Reserve but was not recorded during the Biota survey (Biota, 2006). The species could be present at Mt Keith in any habitat described above. However, the habitats present are well represented in the region and as such the vegetation within the application area is not likely to represent significant habitat for this species.

The Rainbow Bee-eater is able to utilise a wide range of habitat types and nests in sandy soils (DEWHA, 2008). The species was recorded by Biota during the survey exclusively within DRMS (Drainage Line Mulga Shrublands) vegetation type within the Monk Land System (Biota, 2006). However, this vegetation type is well represented throughout the region and therefore, vegetation within the application area is not likely to represent significant habitat for this species.

The proposed clearing may potentially result in the displacement and mortality of some individual fauna. However, the site was inspected by an environmental assessor for the presence of significant fauna habitat in February 2007. This officer reported that although no sites are significant fauna habitat in a regional context, a small area known colloquially as 'Lake Jane' where water ponds against the foot of the western waste dump, supports waterbirds, finches, birds of prey and other small birds. The environmental assessor considered that this area has importance as fauna habitat on a local scale, however, this area is not within the application area.

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

**Methodology** Biota (2006)  
Coffey Environments (2008)  
DEC (2009)  
DEWHA (2008)  
EPA (2002)

**(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**

A search of available GIS databases identified the following rare or priority flora species within a 50 km radius of the application area: *Hemigenia exilis* (P4) and *Grevillea inconspicua* (P3) (GIS Database). There are no records of any Declared Rare or Priority flora occurring within the application area, although a population of *H. exilis* is known to occur immediately to the south west of the western waste dump at Mt Keith Operations (Western Botanical, 2006).

Western Botanical were commissioned by the proponent to undertake a botanical survey of the application area, involving a review of habitat mapping previously conducted by Cockerton and Stratford in 1997, review of the flora of the MKO project area with an emphasis on updating knowledge of significant species that may occur within the application area. The on site component of the survey took place between the 1st and 4th August 2006 (Western Botanical, 2006). The survey and subsequent report adequately meets the requirements of Guidance Statement 51 - *Guidance for the Assessment of Environmental Factors - terrestrial flora and vegetation surveys for Environmental Impact Assessment in Western Australia* (EPA, 2004).

As a result of the survey, Western Botanical identified a population of *Goodenia modesta* (P3) within the known *H. exilis* population referred to above (Western Botanical, 2006). This population is not within the application area and the proposed clearing is not likely to impact on the conservation of this population or the species.

The *H. exilis* population is known to the proponent and receives intensive and specific management (Western Botanical, 2006). There is a risk that this population and the *G. modesta* population may suffer from flooding due to the construction of mine dumps, if adequate drainage is not provided.

In addition to the above flora survey the assessing officer conducted a search of DEC databases for flora of conservation significance that has been recorded within a 50km radius of the application area. This search identified the following Priority flora species that could potentially occur within the application area based on known distribution (DEC, 2008):

- *Acacia balsamea* (P4).
- *Anacampseros* sp. *Eremaean* (P1).
- *Baeckea* sp. Melita Station (P3).
- *Calytrix erosipetala* (P3).
- *Calytrix uncinata* (P3).
- *Eremophila pungens* (P4).
- *Frankenia georgei* (P3).

Although these conservation significant flora have the potential to occur within the application area, they have not been recorded within the application area during previous flora and vegetation surveys.

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

**Methodology** DEC (2008)  
EPA (2004)  
Western Botanical (2006)  
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 Threatened Ecological Communities (TEC's) within the area applied to clear (GIS Database). The nearest known TEC is the Depot Springs Stygofauna community located approximately 85km south-west of the application area (GIS Database).

BHP Billiton (2008) report that no TEC's occur within the application area.

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

**Methodology** BHP Billiton (2008)  
GIS Database  
- Threatened Ecological Communities (TECs)

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

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

The application area falls within the IBRA Murchison Bioregion (GIS Database). Shepherd et al. (2001) report that approximately 100% of the pre-European vegetation still exists within this Bioregion (see table). The vegetation in the application area is recorded as Beard Vegetation Association 39: shrublands; mulga scrub (Shepherd et al, 2001). According to Shepherd et al. (2001) approximately 100% of this vegetation association remains within the Bioregion (see table below).

Therefore, the vegetation within the application area is not a significant remnant of native vegetation within an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion – Murchison	28,120,558	28,120,558	~100	Least Concern	1.1
Beard veg assoc. – State					
39	6,613,602	6,613,496	~100	Least Concern	7.2
Beard veg assoc. – Bioregion					
39	1,148,411	1,148,411	~100	Least Concern	0.0

\* Shepherd et al. (2001) updated 2005

\*\* Department of Natural Resources and Environment (2002)

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

**Methodology** Department of Natural Resources and Environment (2002)  
Shepherd et al. (2001)  
GIS Database  
- Interim Biogeographic Regionalisation of Australia (IBRA)

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

**Comments Proposal is at variance to this Principle**

According to available GIS Databases, there are no permanent watercourses within the application area, however, there are several minor, non-perennial watercourses within the application area (GIS Database).

The Wiluna region has a high average annual evaporation rate of approximately 3,400mm which is significantly higher than its average annual rainfall of approximately 256.9mm (BoM, 2008). Based on this, the watercourses within the application area would only be expected to carry water during high rainfall events as during normal rainfall events surface water is either quickly utilised by vegetation or lost to evaporation.

Several of the drainage lines are diverted by drains around the mine (BHP Billiton, 2008). Western Botanical (2008) reported that there is the potential for hydrological isolation of the existing DRMS habitat that will remain between the new road alignment and the MKO Central Discharge Tailings Storage Facility (CDTSF). Western Botanical (2008) recommend that adequate planning incorporating appropriately located culverts under the road alignment should be conducted to minimise the potential for interruption to surface hydrology in the undisturbed habitats downstream. The diversions are subject to the Mining Proposal assessment, required under the *Mining Act 1978*.

Based on the above, the proposed clearing is at variance to this Principle. Management measures which address drainage diversion and hydrological isolation of vegetation communities will be implemented through the Mining Proposal assessment under the *Mining Act 1978*.

**Methodology** BoM (2008)  
BHP Billiton (2008)  
Western Botanical (2008)  
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 is mapped as occurring within the Ararak, Jundee, Monk, and Sherwood land systems (GIS Database).

The Ararak land system is described as broad plains with mantles of ironstone gravel supporting mulga shrublands with wanderrie grasses (Payne et al, 1998). As a result of low slopes, protective soil mantles and very diffuse sheet flow, this land system is generally not susceptible to soil erosion and is only mildly susceptible to water starvation problems and consequent loss of vigour in vegetation (Payne et al, 1998).

The Jundee Land System is described as hardpan plains with ironstone gravel mantles, supporting Mulga shrublands (Curry et al, 1994). Impedance to natural sheet flows can initiate soil erosion and cause water starvation and consequent loss of vigour in vegetation downslope (Curry et al, 1994).

The Monk land system is described as hardpan plains with occasional sandy banks, supporting Mulga shrublands and Wanderrie grasses (Curry et al, 1994). Drainage tract land units within the system are mildly susceptible to water erosion. Alteration of natural flow regimes may lead to water starvation of vegetation down gradient (Curry et al, 1994).

The Sherwood land system is described as granite breakaways and extensive stony plains with mulga shrublands and minor halophytic shrublands (Payne et al, 1998). The lower footslopes, alluvial plains and drainage tracts of this land unit generally have fragile soils which are highly susceptible to water erosion (Payne et al, 1998). In particular the lower footslopes of the land unit are particularly fragile and require sensitive management to avoid irreversible land degradation (Payne et al, 1998).

Based on the above, the proposed clearing may be at variance to this Principle. It is recommended that should a permit be granted a condition be imposed regarding maintaining the flow of watercourses within the application area.

**Methodology** Curry et al. (1994)  
Payne et al. (1998)  
GIS Database  
- Rangeland Land System Mapping

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

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

The nearest conservation area is the Wanjarri Nature Reserve located approximately 4km south-east of the application area (GIS Database). Given the distance of the application area from any conservation areas, the proposed clearing of native vegetation is not expected to have an impact on the environmental values of any conservation areas.

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

**Methodology** GIS Database  
- CALM managed land and waters

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

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

The application area is located within a semi-arid region with an average annual rainfall of approximately 256.9mm and an annual average evaporation rate of approximately 3,400mm (BoM, 2008). Most of this rainfall occurs primarily from November to March due to tropical bearing depressions and rainfall at this time can be brief but heavy (BoM, 2008; BHP Billiton, 2008). Run-off is likely to be as sheet flow and fresh, although heavy with sediments (BHP Billiton, 2008).

Groundwater levels within the application area and surrounds are approximately 20 to 35m below ground level and are considered fresh to brackish (BHP Billiton, 2008). Mine dewatering has caused groundwater levels to drop within the vicinity of the mine (BHP Billiton, 2008) and due to the high evaporation rate and low rainfall of the area, the recharge rate to the aquifer is likely to be low. In consideration of the above, the proposed clearing of native vegetation is unlikely to cause a decrease in surface or groundwater quality or groundwater quantity.

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

**Methodology** BHP Billiton (2008)  
BoM (2008)

**(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**

There are no permanent water features within the application area, however, there are several minor, non perennial watercourses within the application area (GIS Database). During times of high rainfall, the relatively flat topography of the application area and low relief can result in surface water flows (BHP Billiton, 2008). Surface water flows across the site to the east and south-east, in both identifiable streams and as sheet flow (BHP Billiton, 2008). Engineered drainage lines divert these surface water flows around the Mt Keith mine and concentrator (Sinclair Knight Merz, 2008 as cited in BHP Billiton, 2008).

The Wiluna area has a high annual average evaporation rate of 3,400mm which is significantly greater than its average annual rainfall of approximately 256.9mm (BHP Billiton, 2008). Therefore, surface water resulting from heavy rainfall is likely to be relatively short-lived. In consideration of this, the clearing of 118ha of native vegetation, in comparison to the Lake Carey catchment area (11,378,200ha) (GIS Database), is not likely to lead to an increase in 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 (2008)  
GIS Database  
- Hydrographic catchments - catchments  
- Hydrography, linear

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

**Comments**

There are no Native Title claims over the area under application (GIS Database).

There are several Aboriginal Sites of Significance within the application area (Site IDs: 17228, 21487 and 2719) (GIS Database). However, 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, without authority from the Department of Indigenous Affairs (DIA).

It is the proponent's responsibility to liaise with the DEC and 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.

There were no public submissions received during the public comments period.

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

**4. Assessor's comments**

**Comment**

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

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

**5. References**

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- Western Botanical (2008) Flora and Vegetation Assessment. Western Botanical, Western Australia.

## 6. Glossary

### Acronyms:

<b>BoM</b>	Bureau of Meteorology, Australian Government.
<b>CALM</b>	Department of Conservation and Land Management, Western Australia.
<b>DAFWA</b>	Department of Agriculture and Food, Western Australia.
<b>DA</b>	Department of Agriculture, Western Australia.
<b>DEC</b>	Department of Environment and Conservation
<b>DEH</b>	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
<b>DEP</b>	Department of Environment Protection (now DoE), Western Australia.
<b>DIA</b>	Department of Indigenous Affairs
<b>DLI</b>	Department of Land Information, Western Australia.
<b>DoE</b>	Department of Environment, Western Australia.
<b>DMP</b>	Department of Mines and Petroleum, Western Australia.
<b>DOLA</b>	Department of Land Administration, Western Australia.
<b>DoW</b>	Department of Water
<b>EP Act</b>	Environment Protection Act 1986, Western Australia.
<b>EPBC Act</b>	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
<b>GIS</b>	Geographical Information System.
<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia.
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
<b>RIWI</b>	Rights in Water and Irrigation Act 1914, Western Australia.
<b>s.17</b>	Section 17 of the Environment Protection Act 1986, Western Australia.
<b>TECs</b>	Threatened Ecological Communities.

### Definitions:

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005*. Department of Conservation and Land Management, Como, Western Australia} :-

- P1** **Priority One - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P2** **Priority Two - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P3** **Priority Three - Poorly Known taxa:** taxa which are known from several populations, at least some of which



are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.

- P4** **Priority Four – Rare taxa:** taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
- R** **Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):** taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
- X** **Declared Rare Flora - Presumed Extinct taxa:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

**{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-**

- Schedule 1** **Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
- Schedule 2** **Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
- Schedule 3** **Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.
- Schedule 4** **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

**{CALM (2005). Priority Codes for Fauna. Department of Conservation and Land Management, Como, Western Australia} :-**

- P1** **Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2** **Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P3** **Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P4** **Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
- P5** **Priority Five: Taxa in need of monitoring:** Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

**Categories of threatened species (Environment Protection and Biodiversity Conservation Act 1999)**

- EX** **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.
- EX(W)** **Extinct in the wild:** A native species which:  
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or  
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
- CR** **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
- EN** **Endangered:** A native species which:  
(a) is not critically endangered; and  
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
- VU** **Vulnerable:** A native species which:  
(a) is not critically endangered or endangered; and  
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

**CD**

**Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.