



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2492/1
Permit type: Area Permit

1.2. Proponent details

Proponent's name: MR William David & Irene Margaret Phillips

1.3. Property details

Property: Mining Lease 70/291
Local Government Area: Shire Of Manjimup
Colloquial name: LOT 2 ON DIAGRAM 98776 (LAKE MUIR 6258)

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
5		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	
	<p>Beard vegetation associations have been mapped at a 1:250,000 scale for the whole of Western Australia and are useful to look at vegetation extent in a regional context. Three Beard vegetation associations are located within the application area (GIS Database):</p> <p>3: Medium forest; jarrah-marri. According to the Shared Land Information Platform (SLIP, 2008), Beard vegetation association 3 is co-dominated by <i>Eucalyptus marginata</i>, <i>Corymbia calophylla</i> over <i>Banksia grandis</i>, <i>Nuytsia floribunda</i>, <i>Persoonia longifolia</i>, <i>Acacia browniana</i>, <i>Agonis marginata</i> over <i>Bossiaea linophylla</i>, <i>Dryandra formosa</i>, <i>Hakea amplexicaulis</i>, <i>Acacia extensa</i>, <i>Agonis theiformis</i>, <i>Bossiaea ornata</i>, <i>Hakea oleifolia</i>, <i>Hakea varia</i>, <i>Hemigenia divaricata</i>, <i>Hibbertia amplexicaulis</i>, <i>Hovea elliptica</i>, <i>Hypocalymma angustifolium</i>, <i>Isopogon dubius</i>, <i>Leucopogon propinquus</i>, <i>L. verticillatus</i>, <i>Macrozamia reidleyi</i>, <i>Oxylobium sp.</i>, over <i>Kennedia prostrata</i>, <i>Petrophile diversifolia</i>, <i>Petrophile surruriae</i>, <i>Podocarpus drouyanianus</i>, <i>Xanthorrhoea preissii</i>, <i>Clematis pubescens</i>, <i>Hardenbergia comptoniana</i>, <i>Kennedia coccinea</i>, <i>Acacia alata</i>, <i>Pimelea lehmanniana</i>, <i>Verticordia habrantha</i>, <i>Anarthria prolifera</i>, <i>Conostylis sp.</i>, <i>Johnsonia lupulina</i>, <i>Xanthosia rotundifolia</i>, <i>Lepidosperma angustatum</i> and <i>Pteridium esculentum</i>. This vegetation type does not exist within the application area.</p> <p>973: Low forest; paperbark (<i>Melaleuca raphiophylla</i>). According to the Shared Land Information Platform (SLIP, 2008), Beard vegetation association 973 is a forest of <i>Melaleuca raphiophylla</i>.</p> <p>1134: Medium Woodland; jarrah (south coast). According to the Shared Land Information Platform (SLIP, 2008), Beard vegetation association 1134 is dominated by <i>Eucalyptus marginata</i>, over <i>Xylomelum occidentale</i>, over <i>Kinga australis</i>, <i>Dasypogon hookeri</i>, <i>Banksia grandis</i>, <i>Allocasuarina humilis</i> over <i>Xanthorrhoea sp.</i> This vegetation type does not exist within the application area.</p> <p>A flora survey conducted by Ms Lee Fontanini and Ms Pat Dundas over the survey area in October 2008 described one vegetation type within the application area as:</p> <p>Open forest of <i>Melaleuca raphiophylla</i> over low open woodland of <i>Melaleuca raphiophylla</i> over an open shrubland over <i>Myoporum tetrandrum</i> over a very open shrubland of <i>Myoporum tetrandrum</i> over a grassland over <i>Bromus diandrus</i>, <i>Ehrharta longifolia</i> and <i>Briza maxima</i> over a herbland of <i>Centella asiatica</i> and <i>Cirsium vulgare</i>.</p> <p>(* denotes weed species)</p>
Clearing Description	William David and Irene Margaret Phillips have applied to clear 5 hectares of native vegetation. Clearing will be done incrementally by machinery.
Vegetation Condition	Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994)
Comment	Vegetation condition was assessed by Fontanini and Dundas during their flora survey. The assessing officer conducted a site visit in August 2008 and concurs with the assessment by Fontanini and Dundas.

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 occurs within the Jarrah Forest Interim Biogeographic Regionalisation of Australia (IBRA) Bioregion, and the Southern Jarrah Forest IBRA sub-bioregion (GIS Database). The sub-bioregion is characterised by Jarrah-Marri forest on laterite gravels and, in the eastern part, by Wandoo - Marri woodlands on clayey soils (CALM, 2002). Jarrah forests occur in a mosaic with a variety of species-rich shrublands. There are extensive areas of swamp vegetation in the south-east, dominated by Paperbarks and Swamp Yate (CALM, 2002). The application area is an area of paperbark (*Melaleuca raphiophylla*) swamp.

The application area forms part of the Byenup Lagoon System which is a nationally significant wetland system (CALM, 2002, Department of Environment, Water, Heritage and the Arts, 2008a). The swamp is subject to seasonal inundation and is waterlogged only in winter or spring.

A flora survey was conducted over the application area in October 2008 (Fontanini et al, 2008). This survey identified a very low number of flora species, which may be explained by historical draining and clearing for market gardening (Fontanini et al, 2008). In total, only 11 native flora species were identified. The area is also heavily weed infested, with 19 weed species identified within the application area. Fontanini et al (2008) commented on the complete lack of orchid species in the application area, which would have been expected to occur despite the weed infestation. The application area is an area of low biodiversity compared with other wetland areas within the sub-bioregion. During an inspection by the assessing officer, a lack of understorey was noted and historical drainage works were observed. The assessing officer also observed the mine void adjoining the paperbark swamp left by previous peat mining and noted that the fringing vegetation did not appear to be suffering any effects of altered pH levels.

The degradation that has resulted from historical clearing, drainage and weed infestation has resulted in this area being of little value as fauna habitat.

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

Methodology

CALM (2002)
Department of Environment, Water, Heritage and the Arts (2008a)
Fontanini et al (2008).
GIS Database:
- Interim Biogeographic Regionalisation of Australia
- Interim Biogeographic Regionalisation of Australia (subregions)

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Comments

Proposal is not likely to be at variance to this Principle

The assessing officer conducted a desktop search of the Western Australian Museum's Faunabase and the Department of Environment and Conservation (DEC) Nature Map to determine what species of conservation significance may occur within the application area. The search was based on the coordinates 116.5821°E, 34.4660°S and 116.6904°E, 34.5579°S, representing a search area of approximately 50 km x 50 km surrounding the application area.

As a result, a total of 37 Avian, 6 Reptilian, 11 Mammalian and 1 Amphibian fauna species have been recorded within the search area (DEC, 2007 - 2009); Western Australian Museum, 2008). Of these, the following fauna species are of conservation significance: Lake Muir's Corella (*Cacatua pastinator pastinator*), Malleefowl (*Leipoa ocellata*), Forest Red Tail Black Cockatoo (*Calyptorhynchus banksii naso*), Baudin's White Tail Black Cockatoo (*Calyptorhynchus baudinii*), Chuditch (*Dasyurus geoffroyi*), Tammar Wallaby (*Macropus eugenii derbiansis*), Western Brush Wallaby (*Macropus irma*), Quokka (*Setonix brachyurus*), Quenda (*Isoodon obesulus fusciventer*) and Woylie (*Bettongia penicillata ogilbyi*).

Based on preferred habitat type the following species may occur within the application area.

The Chuditch (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice 2008*) occupies a wide range of habitats from woodlands, dry sclerophyll (leafy) forests, riparian vegetation, beaches and deserts (DEC, 2008a). They have large home ranges of up to 15 sq. km (males) (DEC, 2008a). Chuditch den in hollow logs and burrows and have also been recorded in tree hollows and cavities. Suitable hollow or burrow entrance diameters are often at least 30 cm in diameter. An adult female Chuditch may utilise an estimated 66 logs and 110 burrows within her home range (DEC, 2008a). This species may occur within the application area due its large home range. However, given this large range, the vegetation within the application area is not significant habitat for this species, particularly given the large amount of jarrah forest located within State Forest and National Park located in close proximity to the west of the application area.

The Quokka (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice 2008*) where it occurs on the mainland are known to inhabit densely vegetated

swamps and sometimes tea-tree thickets on sandy soils along creek systems and dense heath on slopes (DEC, 2008b). The boggy paperbark forest within the application area may provide habitat for the Quokka. However, the understorey within the application area is largely absent due to historical disturbances, and the area is surrounded by farmland and timber plantation. Therefore, it is not likely to be prime habitat for the species and it is unlikely to occur there.

The Quenda (DEC – Priority 4) is known to inhabit dense scrubby, often swampy vegetation with dense cover up to one metre high and often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover (DEC, 2008c). Whilst the application area is a boggy paperbark forest, the lack of a dense understorey suggests that it is not likely to be prime habitat for the Quenda, although it may occur there occasionally.

The vegetation within the application area is an open forest of *Melaleuca raphiophylla* (paperbark) and is not likely to be significant habitat for fauna generally, particularly given prior historical disturbance, weed infestation, lack of understorey and disturbance to the edge of the vegetation from past peat mining efforts.

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

Methodology DEC (2007 - 2008)
DEC (2008a)
DEC (2008b)
DEC (2008c)
Western Australian Museum (2008)

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

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

According to available databases, no Declared Rare or Priority flora species occur within the application area (GIS Database). The nearest population of Declared Rare or Priority flora occurs approximately 400 metres south of the application area in similar vegetation. This is a population of orchid (*Caladenia harringtoniae*) (GIS Database).

A flora survey was conducted over the application area by Fontanini and Dundas in October 2008 (Fontanini et al, 2008). This survey involved a search of available databases to identify conservation significant flora which may occur within the application area based on location and habitat preference. A ground based flora survey was then conducted to search for conservation significant flora, as well as identify vegetation types and assess vegetation condition (Fontanini et al, 2008).

As a result of this flora survey, no Declared Rare or Priority flora species were identified within the application area (Fontanini et al, 2008). Despite suitable habitat type, no orchids were identified within the application area, including *C. harringtoniae*.

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

Methodology Fontanini et al (2008)
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

According to available databases, no Threatened or Priority Ecological Communities (TEC or PEC) occur within the application area (GIS Database). The nearest PEC occurs approximately 250 km south-east of the application area.

The vegetation type identified by Fontanini et al (2008) is not representative of a Threatened Ecological Community.

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

Methodology Fontanini et al (2008).
GIS Database:
- Threatened Ecological Communities

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

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

According to available GIS databases, the application area occurs within the Jarrah Forest IBRA Bioregion and Southern Jarrah Forest IBRA sub-bioregion (GIS Databases). The Jarrah Forest IBRA Bioregion remains at

53.8% of its pre-European vegetation extent (Shepherd et al, 2001). This gives the IBRA Bioregion a conservation status of 'Least concern' according to 'Bioregional Conservation Status of Ecological Vegetation Classes' (Department of Natural Resources, 2002). See table below.

The Southern Jarrah Forest IBRA sub-bioregion remains at 50.2% of its pre-European extent (Shepherd et al, 2001). However, given the disturbances that much vegetation has been subject to within the south-west of Western Australia, the assessing officer considers that its conservation status should be 'Depleted' according to 'Bioregional Conservation Status of Ecological Vegetation Classes' (Department of Natural Resources, 2002).

Vegetation within the Shire of Bridgetown - Greenbushes remains at 67.9% of its pre-European extent (Shepherd et al, 2001). This gives the local government area a conservation status of 'least concern' according to 'Bioregional Conservation Status of Ecological Vegetation Classes' (Department of Natural Resources, 2002). See table below.

Of the three Beard vegetation types mapped within the application area, only one vegetation type is representative of the vegetation identified by Fontanini et al (2008). This is Beard vegetation type 973 (Low Forest; paperbark (*Melaleuca raphiophylla*). Approximately one third of this vegetation type remains in the state of Western Australia. However, it is better represented within the Southern Jarrah Forest IBRA sub-bioregion and has a conservation status of 'Least Concern' according to 'Bioregional Conservation Status of Ecological Vegetation Classes' (Department of Natural Resources, 2002).

The proposed clearing will not cause vegetation extents to fall below threshold levels. The threshold level below which species loss appears to accelerate exponentially at the ecosystem level is regarded as being at a level of 30% of the pre-clearing extent of the vegetation type (EPA, 2000).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status+	Pre-European % in IUCN Class I-IV Reserves (current %)*
IBRA Bioregion – Jarrah Forest	4,506,674.5	2,426,078	~53.8	Least Concern	14 (25.5)
IBRA Sub-bioregion – Southern Jarrah Forest	2,607,875	1,308,941	~50.2	Depleted	16.8 (32.8)
Local Government: Bridgetown-Greenbushes	135,387	91,961	~67.9	Least Concern	na
Beard veg assoc. – State					
3	2,661,197	1,863,967	~70	Least Concern	18.5 (26.2)
973	4,988	1,627	~32.6	Depleted	6 (6.9)
1134	37,491	31,239	~83.3	Least Concern	51.4 (60.2)
Beard veg assoc. - bioregion					
3	2,390,535	1,482,495	~69.5	Least Concern	16.3 (23.3)
973	2,448	1,333	~54.4	Least Concern	4.6 (0.1)
1134	23,086	18,328	~79.4	Least Concern	37.5 (45.3)
Beard veg assoc. - sub-bioregion					
3	1,482,495	913,332	~61.6	Least Concern	18.7 (30.2)
973	2,207	1,320	~59.8	Least Concern	0
1134	23,086	18,328	~79.4	Least Concern	37.5 (45.3)

* Shepherd et al. (2001)

** Department of Natural Resources and Environment (2002)

Options to select from: Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment 2002)
 Presumed extinct+ Probably no longer present in the bioregion

Endangered+	<10% of pre-European extent remains
Vulnerable+	10-30% of pre-European extent exists
Depleted+	>30% and up to 50% of pre-European extent exists
Least concern+	>50% pre-European extent exists and subject to little or no degradation over a majority of this area
+ or a combination of depletion, loss of quality, current threats and rarity gives a comparable status	

* Shepherd et al. (2001) updated 2005

** Department of Natural Resources and Environment (2002)

The application area occurs in vegetation that adjoins DEC vested State Forest and National Park and occurs in an area that has healthy amounts of remnant vegetation. As a result, it is not considered to be a remnant of vegetation in an area that has been extensively cleared.

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

Methodology Department of Natural Resources (2002)
 EPA (2000)
 Fontanini et al (2008)
 Shepherd et al (2001)
 GIS Databases:
 - Interim Biogeographic Regionalisation of Australia
 - Interim Biogeographic Regionalisation of Australia (subregions)
 - Pre-European Vegetation

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

Comments Proposal is at variance to this Principle

The application area occurs within a boggy paperbark forest. The assessing officer conducted a site visit of the area in August 2008 and noted a lack of surface water, although it was evident that water was just below the surface. An area adjacent to the application area has already been mined for peat and during the inspection was an open void full of water. Some waterbirds were observed on the open water. The applicant demonstrated how the wetland had been drained many years ago by a former owner for to establish a market garden.

The wetland is considered to be an Environmentally Sensitive Area as it is mapped as a part of the Byenup Lagoon System, a nationally important wetland. Specifically, the area is mapped as 'flats subject to inundation' (Department of Environment, Water, Heritage and the Arts, 2008a). The wetland also marks the terminus of Deep River (GIS Database). Byenup Lagoon System is described as macro-scale irregular-ovoid/round lakes, swamps and flats east and north of Lake Muir, which form a natural assembly of poorly drained country (Department of Environment, Water, Heritage and the Arts, 2008a). Minor swamps and broad flats are inundated or waterlogged only in winter and spring. Most wetlands have low closed forest or closed scrub. The area is well known for its peat (Department of Environment, Water, Heritage and the Arts, 2008a).

Based on the above, the proposed clearing is at variance to this Principle. However, the environmental values of this wetland have been compromised by weed invasion, historic draining activities and peat mining.

Methodology Department of Environment, Water, Heritage and the Arts (2008a)
 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 is not likely to be at variance to this Principle

According to available databases (GIS Databases), the soil types within the application area are described as:

Cb43: Plains-swampy flats with shallow swamps and lakes, some lunettes: chief soils are various leached sands which may have thin peaty surface horizons (Bureau of Rural Sciences, 1992); and

Cd22: Flat to gently undulating portions of lateritic plateau at moderate elevation, occasional low hills, some tors: chief soils are leached sands, some only 6 inches thick, underlain by thick ironstone gravel and boulder layers and mottled kaolinitic clays at depths below 2-5 ft. Associated are small swampy areas of unit Cb43 soils (Bureau of Rural Sciences, 1992).

The assessing officer considers that the soils within the application area are more likely to be representative of Cb43. Wet soils such as these are common in swamps, where they are likely to be organic (Shocknecht, 2002). The soil is saturated for the majority of the year. Wet soils are not likely to be erodible by wind or water. They are likely to be acidic due to the high organic content (Shocknecht, 2002).

Previous peat mining efforts in this swamp area have left a void (pond) that is full of water. This pond was home to several species of water fowl during the site inspection conducted by the assessing officer in August 2008. The removal of vegetation within the application area and the subsequent removal of peat soil will extend this pond area. However, the peat mine has been in operation for many years and fringing vegetation around the pond has not shown any sign of stress due to acidity. The removal of 5 hectares of vegetation to continue mining operations is not likely to cause acidification.

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

Methodology BRS (2008)
Shocknecht (2002)
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**
According to available databases, the application area occurs within 300 metres of Lake Muir Nature Reserve, Boyndaminup National Park and Lake Muir State Forest (GIS Database).

Lake Muir Nature Reserve occurs to the east of the application area. It is a large brackish/saline lake that has been nominated for listing as a Wetland of International Importance under the RAMSAR convention (Department of Environment, Water, Heritage and the Arts, 2009). It is an important wetland for many waterbirds, including at least five migratory bird species. Lake Muir State Forest and Boyndaminup National Park occur to the west of the application area.

The application area does not represent an ecological linkage between the National Park, State Forest and Nature Reserve, as the greater majority of the swamp in which the application area occurs will remain post clearing. The vegetation within the application area is well represented within conservation estate at a sub-bioregional level.

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

Methodology Department of Environment, Water, Heritage and the Arts (2009).
GIS Database:
- CALM Managed Lands and Waters

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

Comments **Proposal is not likely to be at variance to this Principle**
According to available databases, the application area is within the Deep River Water Reserve, gazetted under the *Country Areas Water Supply Act, 1947* (CAWS Act) (GIS Database). Advice has been received from the Department of Water that 'although the Deep River Catchment was proclaimed as a Water Reserve under the CAWS Act in September 1978 it has not been made a CAWS Act Second Schedule "controlled land". Consequently, CAWS Act Part IIA clearing controls do not apply in this catchment' (DoW, 2009). This advice suggests that the clearing of 5 hectares of native vegetation within this catchment is not likely to significantly impact on the quality of surface or groundwater.

The application area occurs within a swamp area that is seasonally inundated. Surface water flows in the area are inward towards the swamp. Previous peat mining efforts within the swamp have created a small artificial pond. The clearing of 5 hectares of vegetation within the swamp is likely to cause temporary turbidity of the waters of the pond. However, this water is contained within the pond and water levels are likely to be significantly lower during summer, and may even dry out, depending on climatic conditions.

According to available databases, the groundwater in this area is likely to be brackish, with salinity levels of approximately 3000 - 7000 mg/L Total Dissolved Solids (TDS). The applicant has advised that the water in the mining void is brackish. The clearing of 5 hectares of vegetation is not likely to alter the quality of this brackish water.

The removal of 5 hectares of vegetation is not likely to lower groundwater levels in the swamp, which are approximately at the surface during winter and fall during summer.

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

Methodology DoW (2009)
GIS Database:
- Public Drinking Water Source Areas (PDWSA's)
- Groundwater Salinity, Statewide

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

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

The application area occurs within a paperbark swamp. This area is subject to seasonal inundation as well as high groundwater levels. Previous peat mining efforts within the swamp have created an artificial pond which was full of water during an inspection conducted by the assessing officer in August 2008. However, it is expected that water levels in this area would fall during summer and may even dry out depending on climactic conditions. Surface water flows in this area flow directly into the swamp area (GIS Database). It is not likely that the clearing of 5 hectares of vegetation within the swamp will cause additional flooding in this area.

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

Methodology GIS Database:
- Hydrography, Linear

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

Comments

The application area occurs within M70/291, located on private property. There is no native title on private property.

The application area occurs Aboriginal Site of Significance site 21909 (Yeriminup/Frankland Hunting and Camping Areas). It is the proponent's responsibility to comply with the Aboriginal Heritage Act, 1972 and ensure that no sites of Aboriginal significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Environment and Conservation and the Department of Water to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

No public submissions were received during the advertised public comments period.

Methodology GIS Database:
Aboriginal Sites of Significance

4. Assessor's comments

Comment

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

It is recommended that should a permit be granted, conditions be endorsed on the permit with regards to recording the areas cleared and reporting the areas so cleared.

5. References

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6. Glossary

Acronyms:

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

Definitions:

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

- P1** **Priority One - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P2** **Priority Two - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P3** **Priority Three - Poorly Known taxa:** taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
- P4** **Priority Four – Rare taxa:** taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
- R** **Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):** taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in

need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

- X Declared Rare Flora - Presumed Extinct taxa:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

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

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

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

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

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

- EX Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.
- EX(W) Extinct in the wild:** A native species which:
- is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
 - 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:
- is not critically endangered; and
 - 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:
- is not critically endangered or endangered; and
 - 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.