



1. Application details

1.1. Permit application details

Permit application No.: 2528/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Kagara Nickel Pty Ltd

1.3. Property details

Property: Mining Lease 77/544
Local Government Area: Shire of Kondinin
Colloquial name: Exploration Drilling

1.4. Application

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

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
<p>Beard Vegetation Associations have been mapped at a 1:250,000 scale for the whole of Western Australia. One Beard Vegetation Association has been mapped within the application area (GIS Database; Shepherd et al., 2001).</p> <p>511: Medium woodland; salmon gum & morrel.</p>	<p>The applicant has applied to clear 0.297 hectares of native vegetation for the purpose of mineral exploration (evaluation drilling). Kagara Nickel Pty Ltd intend to re-establish cleared lines with backhoe using a raised blade. Drill pads will be located on lines previously cleared in the 1970's and 1990's.</p>	<p>Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery 1994)</p>	<p>The vegetation condition was derived from a vegetation survey conducted by Botanica Consulting (2007).</p>

The application area was surveyed by Botanica Consulting staff in October 2007 (Botanica Consulting, 2007). The following vegetation type was identified within the application area.

Eucalyptus woodland: Dominant upperstorey comprised of *Eucalyptus urna* and *E. salubris*, with other upperstorey species including *E. eremophila* spp. *eremophila* and *E. salmonophloia* over a midstorey of *Melaleuca adnata*, *Santalum acuminatum*, *Acacia merrallii* and *A. intricata* over an understorey comprised of *Olearia muelleri*, *Halgania andromedifolia* and *Eremophila decipiens*.

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 Southern Cross Interim Biogeographic Regionalisation of Australia (IBRA) sub-region (GIS Database). This sub-region is characterised by sub dued relief, comprising of gently undulating lands dissected by broad valleys with bands of low greenstone hills (CALM, 2002). The valleys of this sub-region have Quaternary duplex and graduational soils, with chains of saline playa-lakes supporting dwarf shrublands of samphire. Around these lakes, diverse Eucalyptus woodlands, rich in endemic eucalypts occur on the low greenstone hills, valley alluvials and broad plains of calcareous earth (CALM, 2002). At mid-level, the granite basement outcrops and supports swards of *Borya constricta*, with stands of *Acacia acuminata* and *Eucalyptus loxophleba*, while the upper-levels are comprised of the eroded remnants of a lateritic duricrust giving way to yellow sand-plains, gravely sand-plains and lateritic breakaways. Mallees and scrub-heaths occur on the up-lands and sand lunettes associated with playas along the broad valley floors and sand sheets around the granite outcrops (CALM, 2002). The vegetation described within the application area (Botanica Consulting, 2007) is typical of the bioregion.

The application area occurs within the Lake Cronin Red Book Area which is listed on the Register for National Estate for its high level of flora and fauna diversity and endemism. According to the Australian Heritage Database (2008), 16 fauna species that are endemic to either the south-west region or to Western Australia occur within the Lake Cronin area. The Lake Cronin area is also described as being an important refuge for rare species due to widespread clearing in the wheatbelt to the west. Rare species include fauna such as the Malleefowl (*Leipoa ocellata*) and flora species such as *Eucalyptus steedmanii*.

A vegetation survey of the application area and surrounding vegetation identified 30 species of native flora belonging to 18 genera from 14 families (Botanica Consulting, 2007). This is not considered to be biologically diverse. Myrtaceae (9), Mimosaceae (4) and Asteraceae (3) families were the most diverse within the survey area (Botanica Consulting, 2007). This is atypical of the floristics of the Southern Cross IBRA sub-region, as this sub-region is a centre of floral endemism and typically comprising ephemeral floral communities of Tertiary sand plain scrubs and valley floor woodlands with up to 60 species per quadrat (CALM, 2002).

The atypical results of the flora survey are most likely due to the small nature of the area surveyed (3.29 hectares) compared to the area of the subregion (7,041,232 hectares) (CALM, 2002). The application area is located on previously cleared drill lines and as such the vegetation structure has been disturbed (Botanica Consulting, 2007).

An area search of the Western Australian Museum's Faunabase conducted by the assessing officer suggests that the application area is diverse in reptile species, particularly Skinks (16) and Geckos (9) (Western Australian Museum, 2008). The database search found 46 reptile species from 7 families as potentially occurring within the application area, or within a 50 kilometre radius of the application area.

No weed species were recorded from within the application area (Botanica Consulting, 2007).

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

Methodology

Australian Heritage Database (2008)
Botanica Consulting (2007)
CALM (2002)
Western Australian Museum (2008)
GIS Database
- Inteim 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

The assessing officer has conducted a search of the Western Australian Museum's online fauna database between the coordinates 119.14°E, 31.92°S and 120.21°E, 32.81°S, representing a 50 kilometre radius around the application area.

This search identified 11 Amphibian, 15 Mammalian, 24 Avian and 46 Reptilian species that may occur within the application area (Western Australian Museum, 2008). Of these, the following species of conservation significance have previously been recorded within the search area: Heath Rat (*Pseudomys shortridgei*), Malleefowl (*Leipoa ocellata*), Rufous Fieldwren (*Calamanthus campestris*) and the Crested Shrike-tit (*Falcunculus frontatus*).

The Australian Heritage Database (2008) lists the following species as being known to occur within the Lake Cronin Red Book Area: Western Rosella (*Platycercus icterotis xanthogenys*).

The Heath Rat (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially*

Protected Fauna) Notice, 2008) is known to occupy variable habitats. In Western Australia it prefers mature stands of scrub mallee and mixed scrub with *Banksia* on loamy soils, unburnt for at least 30 years (DEC, 2008). This species does not have a restricted range and the vegetation types that comprise its habitat are well represented throughout the bioregion, and the small area proposed to clear (0.297 hectares) in relation to the size of the sub-region (7,041,232 hectares) it is unlikely that the application area contains significant habitat for this species.

Malleefowl (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna)* Notice, 2008) are 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, 2008). However, they can also occur in habitats of acacia, paperbark, she-oak and other scrubs as well as eucalypt woodland and coastal heaths with an abundant layer of leaf litter for use in nest mounds (Garnett & Crowley, 2000). It is unlikely that the application area would provide significant habitat for this species given the vegetation types are well represented within the bioregion and the area proposed to clear is small (0.297 hectares) in relation to the size of the sub-region (7,041,232 hectares).

The wheat belt species of Western Rosella (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna)* Notice, 2008) is described as utilising woodland habitat. Threats include clearing for agriculture affecting availability of food and nesting hollows (Garnett & Crowley, 2000). This species has vast amounts of suitable habitat in the bioregion and due to the small nature of the application area (0.297 hectares) in relation to the larger sub-region (7,041,232 hectares) it is unlikely that it would provide significant habitat for this species.

The Rufous Fieldwren (P4 - DEC Priority Fauna List) is endemic to the south-western Western Australian wheat belt (Saunders & Ingram, 2000). The species inhabits low, sparse heath, saltmarsh or samphire with or without emergent trees (Saunders & Ingram, 2000). The vegetation within the application area provides suitable habitat for this species, however given that the vegetation types are well represented throughout the bioregion and the small area proposed to clear (0.297 hectares) in relation to the size of the sub-region (7,041,232 hectares) it is unlikely that the application area contains significant habitat for this species.

The Crested Shrike-Tit (P4 - DEC Priority Fauna List) is endemic to Western Australia, south-west of a line between Geraldton and Point Culver (Serventy & Whittell, 2000). The Crested Shrike-Tit inhabits eucalypt forest and woodland, favouring smooth barked *Eucalyptus diversicolor*, *E. wandoo*, *E. salmonophloia*, *E. rudis* and *Acacia acuminata* over rough barked species (Serventy & Whittell, 2000). The vegetation within the application area provides suitable habitat for this species, however given that the vegetation types are well represented throughout the bioregion and the small area proposed to clear (0.297 hectares) in relation to the size of the sub-region (7,041,232 hectares) it is unlikely that the application area contains significant habitat for this species.

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

Methodology Australian Heritage Database (2008)
CALM (2002)
DEC (2008)
Garnett & Crowley (2000)
Saunders & Ingram (2000)
Serventy & Whittell (2000)
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 may be at variance to this Principle

According to available databases, no Declared Rare or Priority flora species occur within the application area (GIS Database).

A flora survey was conducted over the application area by Botanica Consulting in October 2007 (Botanica Consulting, 2007). This survey involved the area being traversed by one team of two people via a four wheel drive and on foot where appropriate. Different vegetation groups encountered during the survey were described and the vegetation associations were examined for the presence or absence of any Declared Rare Flora and Priority Flora species (Botanica Consulting, 2007). As a result of this survey one Priority Flora species was identified as occurring within the application area - *Microcorys* sp. *Forrestania* (P4).

Microcorys sp. *Forrestania* (V. English 2004) (P4) is a low erect shrub growing to 40cm tall and flowering January to April (Western Australian Herbarium, 2008). This species appears to thrive after disturbance and was found at two disturbed sites within the application area. The application area is located on previously cleared drill-lines. This species has previously been recorded from Mt Holland and *Forrestania* (Armstrong, 2006). As *Microcorys* sp. *Forrestania* is a disturbance opportunist, the population size is likely to increase following clearing (Armstrong, 2006), provided the area cleared is rehabilitated.

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 on the permit with regard to rehabilitation and stockpiling of all

cleared topsoil and vegetation. Rehabilitation shall take place within six months of the completion of the activity for which the clearing took place, and involves re-shaping the surface of each cleared area using the stockpiled topsoil and vegetation.

Methodology Armstrong (2006)
 Botanica Consulting (2007)
 Western Australian Herbarium (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

A search of available databases reveals that there are no Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest TEC is located approximately 40 kilometres to the north (Parker Range System).

The application area is located to the east of the North Ironcap Hills Complex, which is listed as an 'ecosystem at risk' in 'A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002' (CALM, 2002). The North Ironcap Hills Complexes have been given a status of vulnerable, with threatening processes being listed as mining, changed fire regimes, feral animals (rabbits) and exotic weeds (CALM, 2002). The vegetation types according to the National Vegetation Inventory System (NVIS), listed as occurring in this area are (i) mixed species arid Acacia woodlands and shrublands and (ii) mallee Eucalyptus low open woodlands. The Ironcap Hills Complexes are listed as being in good condition although vulnerable (CALM, 2002).

Based on the above, the proposed clearing is not likely to be at variance to this Principle. It is noted that the proposed clearing will be located on pre-existing drill-lines, therefore it is recommended that should a permit be granted, a condition be imposed on the permit with regard to rehabilitation.

Methodology CALM (2002)
 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 at variance to this Principle

The application area falls within the IBRA Coolgardie Bioregion (GIS Database). Shepherd et al. (2001) report that approximately 98.4% of the pre-European vegetation still exists in this Bioregion (see table below). The vegetation in the application area is recorded as Beard Vegetation Association 511: Medium woodland; salmon gum and morrel (GIS Database; Shepherd et al., 2001). According to Shepherd et al. (2001) approximately 93.8% of Beard Vegetation Association 511 remains within the Coolgardie Bioregion.

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**	% of Pre-European area in IUCN Class I-IV Reserves
IBRA Bioregion – Coolgardie	12,912,208	12,707,623	~98.4	Least Concern	~9.7
Beard veg assoc. – State					
511	700,414	493,992	~70.5	Least Concern	~14.1
Beard veg assoc. – Bioregion					
511	464,427	435,796	~93.8	Least Concern	~17.5

* 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
 - 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 not likely to be at variance to this Principle

According to known GIS datasets, there are no known watercourses or water bodies within the application area.

The application area experiences a rainfall of approximately 343 mm/year according to the nearest recording station at Hyden (BOM, 2008). The application area also experiences a pan evaporation rate of approximately 2200 mm/year (Luke et al., 1987).

There is one minor non-perennial drainage line located approximately 0.45km north of the application area, however it is unlikely that the drainage line would carry water under normal rainfall events, due to high evaporation rates and low rainfall.

Therefore the proposed clearing is unlikely to have any significant impact on any watercourses or wetlands.

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

Methodology BOM (2008)
Luke et al. (1987)
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 GIS Databases, there is one soil type (Ms8) within the application area containing two sub-types;

- (i) on depositional slopes, sandy yellow earths containing some ironstone gravels at depths below 6-7ft;
- (ii) on erosional ridges and slopes, ironstone gravels all underlain by hardened mottled-zone material by depths of 12-24 inches (DAFF, 2008).

The application area is on soil sub-type (i) depositional slope.

Sandy earths have a moderate to high risk of wind erosion while ironstone gravels have a low to moderate risk of wind erosion (Schoknecht, 2002). However, the linear nature of the clearing suggests that the potential for wind erosion is low.

Rainfall in the area is low (343 mm/year - BOM, 2008). The area is described as gently undulating, and run-off will be low due to a high pan evaporation rate (2200 mm/year - Luke et al., 1987) and moderate permeability of soils present. Therefore, the effect of water erosion is likely to be minimal.

Water table depths are reported at 36 metres or lower (deRosario, 1996). The removal of 0.297 hectares of vegetation is unlikely to lead to a rise in water table levels and associated salinisation.

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

Methodology BOM (2008)
DAFF (2008)
deRosario (1996)
Luke et al. (1987)
Schoknecht (2002)
GIS Database
- Soils

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

Comments Proposal may be at variance to this Principle

The application area occurs within an ESA (Red Book area) which is a buffer zone surrounding Lake Cronin. At its closest point, the application area is 5.7 kilometres from the Lake Cronin Nature Reserve boundary (GIS Database).

According to the Australian Heritage Database (2008), the Lake Cronin Nature Reserve is dominated by mallee

and woodland associations.

Lake Cronin Nature Reserve is surrounded by extensive vegetation and the dispersed clearing of 0.297 ha of vegetation at a distance of 5.7 km from the reserve will not affect the ecological linkage to the reserve.

Based on the above, the proposed clearing may be at variance to this Principle (occurring within a buffer for conservation estate). It is considered that the proposed clearing which will take place is of a small scale and there will be no significant impact to the Lake Cronin Reserve or the Red Book area.

Methodology Australian Heritage Database (2008)
GIS Database
- CALM Managed Lands and Waters
- Lakes 250K

(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 not located within a Public Drinking Water Source Area (PDWSA) (GIS Database).

The application area has suffered previous disturbance (Kagara Nickel Pty Ltd, 2007) and the small area of clearing is unlikely to have any impact on ground water level or quality.

There are no permanent water bodies or watercourses within the application area (GIS Database). With an average rainfall of approximately 343 mm/year (BOM, 2008) and an annual pan evaporation rate of 2000 - 2200 mm/year (Luke et al., 1987), there is little surface flow during normal seasonal rains. The proposed clearing is not likely to cause the quality of surface water to deteriorate.

The application area is located within the Yilgarn South-West Groundwater Province (GIS Database). The groundwater salinity within the application area is approximately 14,000 - 35,000 milligrams/Litre Total Dissolved solids (TDS) (GIS Database). Given the size of the area to be cleared (0.297 hectares) compared to the size of the Yilgarn South-West Groundwater Province (24,601,261 hectares) (GIS Database), the proposed clearing is not likely to cause salinity levels within the application area to alter significantly. Groundwater has been measured at depths of 36m or greater. The proposed clearing is not likely to cause groundwater quality to deteriorate.

There are no known Groundwater Dependent Ecosystems within the application area (GIS Database).

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

Methodology BOM (2008)
GIS Database
- Public Drinking Water Source Areas (PDWSA's)
- Potential Groundwater Dependent Ecosystems
- Hydrography, Linear
- Groundwater Province
- 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

Due to the narrow linear nature of the proposed clearing, the proposed clearing is not likely to cause flooding within the application area. The application area receives low rainfall (approximately 343 mm/year) and the topography is gently undulating (GIS Database), suggesting that the area is not likely to be subject to flooding.

The small area to be cleared (0.297 hectares) in relation to the size of the SwanAvon_Lockhart Catchment area (2,839,267 hectares) (GIS Database) is not likely to lead to an increase in flood height or duration.

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

Methodology BOM (2008)
GIS Database
- Topographic Contours - Statewide
- Hydrographic Catchments - Catchments

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

Comments

There are no Native Title Claims over the area under application. The tenement 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 known Aboriginal sites of significance within the application area (GIS Database). The nearest known Aboriginal site of significance is located approximately 6.4 kilometres south-east of 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 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.

One direct interest submission was received in relation to protection of Aboriginal Sites of Significance, however no objection to the proposal was stated.

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

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

5. References

- Armstrong, P. (2006) Vegetation Survey and Rare Flora Search at North Ironcap Prospect, Conducted July 2006. Unpublished report prepared for Hannans Reward Ltd. Paul Armstrong and Associates, Western Australia.
- Australian Heritage Database (2008) Register of National Estate: Lake Cronin Area. <http://www.environment.gov.au/cgi-bin/ahdb/search.pl> (Accessed 10 July 2008).
- Botanica Consulting (2007) Vegetation survey of Proposed Newexco Drill Lines. Prepared for Newexco Pty Ltd. Unpublished Report dated December 2007.
- Bureau of Meteorology (2008) BOM Website - Climate Averages by Number, Averages for HYDEN. www.bom.gov.au/climate/averages/tables/cw_010568.shtml (Accessed 10 July 2008).
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.
- DAFF (2008) Department of Agriculture, Fisheries and Forestry - Digital Atlas of Australian Soils. <http://www.daff.gov.au/brs/data-tools/daas-download> (Accessed 16 July 2008).
- DEC (2008) NatureBase - Fauna Species Profiles. <http://www.naturebase.net/content/view/840/1288/> (Accessed 14 July 2008).
- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
- deRosario, P.C. (1996) Hydrogeological Assessment Lounge Lizard and North Ironcap Forrestania, Western Australia. Unpublished report submitted as supporting documentation by Hannans Reward Ltd. Hydro-Resources, Western Australia.
- Garnett, S.T. and Crowley, G.M. (2000) Action Plan for Australian Birds 2000. Environment Australia, Canberra.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Luke, G.J., Burke, K.L. and O'Brien, T.M. (1987) Evaporation Data for Western Australia. Resource Management Technical Report No. 65. Department of Agriculture, Western Australia.
- Saunders, D.A. and Ingram, J.A. (2000) Action Plan for Australian Birds 2000. <http://www.environment.gov.au/biodiversity/threatened/publications/action/birds2000/recovery.html> (Accessed 15 July 2008).
- Schoknecht, N. (2002) Soil Groups of Western Australia. A Simple Guide to the Main Soils of Western Australia. Resource Management Technical Report 246. Edition 3.
- Serventy, D.L. and Whittell, H.M. (2000) Action Plan for Australian Birds 2000. <http://www.environment.gov.au/biodiversity/threatened/publications/action/birds2000/recovery.html> (Accessed 15 July 2008).
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.
- Western Australian Museum (2008) Faunabase - Western Australian Museum, Queensland Museum and Museum and Art

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.
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:
(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.