



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 6598/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Pinjar Metro Sands Pty Ltd

1.3. Property details

Property: Mining Lease 70/126
Local Government Area: City of Wanneroo
Colloquial name:

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
1.3		Mechanical Removal	Sand Mining

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 23 July 2015

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description Beard vegetation associations have been mapped for the whole of Western Australia and are useful to look at vegetation in a regional context. One vegetation association has been mapped within the application area (GIS Database):

Beard vegetation association 6: Medium woodland; tuart & jarrah.

A level 1 biological survey of the application area and an area to the north was undertaken by a Phoenix Environmental Sciences (Phoenix) on 10 December 2014. The following vegetation associations were identified within the application area (Phoenix, 2015):

LD Area: Tall open *Eucalyptus gomphocephala* woodland over dense *Jacksonia sericea/calicola* (hybrid) shrubland with *Banksia grandis*, *Hibbertia hypericoides*, *Mesomelaena pseudostygia*, *Ptilotus polystachyus*, **Gladiolus ?caryophyllaceus*, **Pelargonium capitatum*, **Euphorbia terracina*, **Avena barbata*, **Ehrharta longiflora* and **Lagurus ovatus*;

PSQ10: Rehabilitated area: Dense *Jacksonia sternbergiana* and *Jacksonia sericea/calicola* (hybrid) shrubland over tall grasses with *Banksia attenuata*, *Ptilotus polystachyus*, *Scaevola canescens*, **Ehrharta longiflora* **Pelargonium capitatum* and **Avena barbata*;

PSQ11: Edge of a disturbed area: *Eucalyptus gomphocephala* over *Acacia xanthina*, **Pelargonium capitatum* and **Euphorbia terracina* over grasses with *Banksia attenuata*, *Olearia axillaris*, *Hardenbergia comptoniana*, *Phyllanthus calycinus* **Foeniculum vulgare* and **Lagurus ovatus*;

PSQ11: Previously excavated. Sparse *Olearia axillaris* and *Hakea prostrata*. Shrubland over **Foeniculum vulgare* weed species and mixed grassland with *Jacksonia sericea/calicola* (hybrid), *Phyllanthus calycinus*, *Ptilotus polystachyus*, **Gladiolus ?caryophyllaceus*, **Pelargonium capitatum*, **Euphorbia terracina*, **Avena barbata*, **Ehrharta longiflora* and **Lagurus ovatus*; and

Completely degraded areas.

Clearing Description Pinjar Metro Sands Pty Ltd proposes to clear up to 1.3 hectares of native vegetation within a total boundary of approximately 3.115 hectares, for the purpose of sand mining. The project is located approximately 9 kilometres south-west of Yanchep, in the City of Wanneroo.

Vegetation Condition Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994);

To:

Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).

Comment

The application area is a cleared Pine (*Pinus pinaster*) plantation, where the native vegetation was cleared over 50 years ago to establish the plantation. The regrowth of native vegetation within the application area historically cleared by previous mining between 1990 and 2003.

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 Perth (SWA2) Interim Biogeographical Regionalisation of Australia subregion (GIS Database). This subregion is comprised of colluvial and Aeolian sands, alluvial river flats, and coastal limestone. It is characterised by Heath and/or Tuart woodlands on limestone, Banksia and Jarrah-Banksia woodlands on Quaternary marine dunes of various ages, and Marri on colluvial and alluvials (Mitchel *et al.*, 2002).

The vegetation that occurs within the application area is regrowth from a Pine (*Pinus pinaster*) plantation that had been cleared progressively up until 2014. The original native vegetation was cleared over 50 years ago to establish the Gnangara Pine Plantation. Phoenix Environmental Sciences (Phoenix) (2015a) conducted a Level 1 flora and vegetation survey of the application area and surrounding region on 14 December 2014. The survey identified seven vegetation types, four of which were recorded within the application area (Phoenix, 2015a). The area proposed to be cleared is not considered to be remnant vegetation and with the vegetation within the application area has been historically cleared by previous mining between 1990 and 2003. The majority of the vegetation within the application area has been previously removed and consists of regrowth (Phoenix, 2015b). The condition of the vegetation types are classified as 'completely degraded' to 'very good' (Keighery, 1994; Phoenix, 2015b). No vegetation units within the application area were considered to be of high conservation significance and habitat diversity was very low within the application area despite being within the Gnangara-Moore River State Forest and Bush Forever Site No. 280 (Phoenix, 2015a; 2015b; GIS Database).

The flora and vegetation survey identified a total of 37 native flora species and 17 non-native flora species (Phoenix, 2015a). No Threatened or Priority Flora species were identified during the flora survey; however an intergrade form of *Jacksonia sericea* (Priority 4) and *Jacksonia calicola* was recorded within the application area (Phoenix, 2015a). The proposed clearing of this intergrade form is not likely to impact the conservation significance of *Jacksonia sericea*.

The application area sits within the buffer zone of a Priority Ecological Community (PEC) 'Northern Spearwood shrublands and woodlands (SCP 24). This PEC is represented by 13 expressions of the community located in four overlapping clusters. The closest cluster (Cutler 06) covers 218 hectares and the application area sits within 1.05% of the total area of the Cutler 06 PEC (Phoenix, 2015a; 2015b). The vegetation within the application area is not considered representative of the PEC due to the sparse nature and degraded condition of the vegetation resulted from previous clearing (Phoenix, 2015b).

Weeds and dieback have the potential to significantly change the dynamics of a natural ecosystem and lower the biodiversity of an area. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed and dieback management condition.

Faunal habitats within the application area are limited due to the lack of vegetative cover and landform features, and the existing level of disturbance (Phoenix, 2015a; 2015b; GIS Database). The application area is not likely to have a higher level of faunal diversity than the surrounding area.

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

Methodology

GIS Database
Keighery (1994)
Mitchel *et al* (2002)
Phoenix (2015a)
Phoenix (2015b)

(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

There was one broad fauna habitat type recorded within the application area based on a Level 1 fauna survey by Phoenix (2015a; 2015b); Eucalyptus or Banksia woodlands over shrubland (Banksia woodland over grasstree shrubs; tall Eucalyptus and Banksia woodland over grasstree shrubs; tall Eucalyptus trees over dense shrublands) and regrowth of sparse Eucalyptus over shrubs and grasses.

Fauna habitat within the application area is limited due to the sparse nature of the understorey and small stature of the regrowth (GIS Database). The application area has been previously cleared for limestone and sand extraction between 1990 and 2003, and the application area is predominately cleared areas with regrowth (GIS Database; Phoenix, 2015b). The very good condition of vegetation is located in the southern portion of the application area, with the Eucalyptus and Banksia woodlands possibly providing potential roosting or foraging habitat for the Carnaby Black Cockatoo (*Calyptorhynchus latirostris*) (EPBC Act - Endangered; WC Act -

Schedule 1). This habitat type however is sparse in nature, has a high weed presence, and lacks a dominant mid and upperstorey vegetation structure (Phoenix, 2015a). There is an availability of similar habitat that appears to be in a better condition outside the area under application (GIS Database; Phoenix 2015a). Phoenix (2015a) identified three potential habitat trees within the application area. None of these trees currently have hollows suitable for breeding activity but they provide potential roosting habitat, although no evidence of roosting by Carnaby Black Cockatoos has been recorded (Phoenix, 2015a). The application area has been designed to avoid as many potential breeding and roosting trees as possible. Several habitat trees with hollows were recorded outside the application area, however three trees cannot be avoided by the proposed clearing (Phoenix, 2015b). Given the degraded nature of the vegetation within the application area and the availability of similar habitat that appears to be in a better condition outside the area under application (GIS Database), the proposed clearing is not likely to impact core foraging or roosting habitat for the Carnaby Black Cockatoo.

The Rainbow Bee-eater (*Merops ornatus*) (EPBC Act - Migratory species; JAMBA, CAMBA) was recorded from direct observation and two burrows were identified in an area of existing disturbance and within Eucalyptus or Banksia woodlands within the application area (Phoenix, 2015a). The Rainbow Bee-eater is seasonally widespread and utilises both natural and degraded habitats. Phoenix (2015a) recorded one burrow was recorded outside the application area. It is unlikely that the burrows recorded within the survey area will be re-used by the nesting pair of Rainbow Bee-eaters that created it; however, it is possible that they may return to the general area to create new burrows (Phoenix, 2015c). Suitable habitat for foraging, roosting and breeding are abundant outside the application area in the local and regional area (Phoenix, 2015a; GIS Database).

The application area overlays limestone therefore consideration needs to be given to subterranean fauna such as Stygofauna and Troglifauna species. Stygofauna are obligate aquatic subterranean animals that live within fresh or saline groundwater systems associated with karst (limestone caves/fissures) (Humphreys, 2006). Troglifauna are obligate fauna that live in air chambers in caves and/or rock fissures above such systems (Humphreys, 2006). Although the clearing of native vegetation may not directly impact subterranean fauna, the removal of trees may have a detrimental impact on Stygofauna and Troglifauna if the tree roots had been utilised as a food source (Humphreys, 2006).

Given the extent of previous clearing that has occurred within the application area, the degraded condition of the majority of the application area and the small area to be cleared (1.3 hectares), the proposed clearing is not likely to impact critical feeding or breeding habitat for any conservation significant fauna species.

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

Methodology GIS Database
Humphreys (2006)
Keighery (1994)
Phoenix (2015a)
Phoenix (2015b)
Phoenix (2015c)

(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, there are no known records of Threatened Flora within the application area (GIS Database). A search of the Department of Parks and Wildlife's Threatened and Priority Flora databases identified no known records of the Threatened Flora species occurring within a 10 kilometre radius of the application area (DPaW, 2015).

Phoenix (2015a) conducted a Level 1 flora survey of the application area and adjacent areas on 11 November 2010. No Threatened Flora was recorded within the survey area.

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

Methodology DPaW (2015)
GIS Database
Phoenix (2015a)

(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, there are no known Threatened Ecological Communities (TECs) within the application area (GIS Database). There are approximately five known TEC's located within 10 kilometres of the application area (GIS Database). The TEC *Melaleuca huegellii* – *Melaleuca systema* shrublands on limestone ridges (SCP 26a) has been identified within the tenement, however a 500 metre buffer of the SCP 26a TEC starts approximately 70 metres south of the application area. Phoenix (2015a; 2015b) did not identify any vegetation communities representing Threatened Ecological Communities within the survey area.

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

Methodology DPaW (2015)
GIS Database
Phoenix (2015a)
Phoenix (2015b)

(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 at variance to this Principle

The application area falls within the Perth subregion of the Swan Coastal Plain IBRA bioregion (GIS Database). Approximately 39% of the pre-European vegetation remains within the bioregion (Government of Western Australia, 2013). The vegetation within the application area is recorded as:

Beard vegetation association 6: Medium woodland; tuart & jarrah (GIS Database).

Beard vegetation association 6 retains approximately 24.88% of its pre-European extent which is less than the 30% threshold level recommended in the National Objectives Targets for Biodiversity Conservation, below which species loss appears to accelerate exponentially at an ecosystem level (EPA, 2000).

The area proposed to be cleared is part of a significant remnant of native vegetation known as Bush Forever Site No. 290 which covers an area of approximately 406.9 hectares (Government of Western Australia, 2000; GIS Database). Bush Forever aims to retain a minimum of 10% of each vegetation complex in the Perth Metropolitan Region (Government of Western Australia, 2000). The vegetation complex for this portion of Bush Forever Site No. 290 has been mapped as Heddle Vegetation Complex Cottesloe – Central and South (GIS Database). Approximately 36% of Heddle Vegetation Complex Cottesloe – Central and South remains (Government of Western Australia, 2000).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves (and post clearing %)
IBRA Bioregion - Swan Coastal Plain	1,501,221	587,708	~39.15	Depleted	10.77 (25.85)
IBRA Subregion - Perth	1,117,757	473,909	~42.40	Depleted	11.95 (26.20)
Local Government - Wanneroo	67,698	31,541	~46.59	Depleted	8.32 (16.66)
Beard vegetation associations - State					
6	56,343	14,019	~24.88	Vulnerable	3.55 (13.38)
Beard vegetation associations - Bioregion					
6	56,343	14,019	~24.88	Vulnerable	3.55 (13.38)
Beard vegetation associations - subregion					
6	56,343	14,019	~24.88	Vulnerable	3.55 (13.38)
Heddle Vegetation Complex					
Cottesloe – Central and South	34,439	12,362	~36.00	Depleted	18

* Government of Western Australia (2013)

** Department of Natural Resources and Environment (2002)

Whilst it is acknowledged that Beard vegetation association 6 and Heddle Vegetation Complex Cottesloe–Central and South are above minimum recommended thresholds (Government of Western Australia, 2000), assessment of aerial imagery confirms that the proposed clearing is within a highly degraded area and that the clearing of native vegetation will be predominately regrowth. Further clearing will not reduce the ecological linkages within the local area, and is unlikely to impact the conservation significance of the pre-European vegetation remaining within the local and regional area.

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

Methodology Department of Natural Resources and Environment (2002)
EPA (2000)
GIS Database
Government of Western Australia (2000)
Government of Western Australia (2013)

(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 at variance to this Principle

According to available databases, there are no permanent watercourses or wetlands within the application area (GIS Database). Phoenix (2015a) did not identify any riparian vegetation within the application area.

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

Methodology GIS Database
Phoenix (2015a)

(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 associated with subdued dune-swale terrain by limestone at depth (Northcote et al, 1968; GIS Database). Chief soils are white sandy soils (Northcote et al, 1968). Generally, these soils have a high risk of wind erosion and a low risk of water erosion due to the high infiltration rates associated with sands. The majority of the area under application has a low risk of salinity. The proposed clearing has a high risk of wind erosion given the sandy soils associated with the area under application, and without appropriate management for exposed surfaces the proposal may cause appreciable land degradation. Potential land degradation impacts as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

The application area intercepts areas categorised as 'low' to 'moderate' Acid Sulphate Soil (ASS) risk (GIS Database). ASS are likely to occur at depths of three metres or greater. The soil exposed from clearing native vegetation is not likely to form acid on exposure to air. Phoenix (2015b) state that the application area does not contain site characteristics that are conducive to ASS.

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

Methodology GIS Database
Northcote et al (1960 - 986)
Phoenix (2015b)

(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 at variance to this Principle

The application area is located within the Gngangara-Moore River State Forest which is managed by the Department of Parks and Wildlife (GIS Database). The Gngangara-Moore River State Forest encompasses an area in excess of 70,000 hectares; however a large portion of this State Forest is covered by pine plantation (GIS Database).

The application area is located within Bush Forever Site No. 290 which covers an area of approximately 406.9 hectares (Government of Western Australia, 2000). Assessment of aerial imagery demonstrates that the area under is predominately regrowth vegetation in a degraded to very degraded condition (Keighery, 1994), and the proposed clearing of 1.3 hectares of native vegetation is unlikely to impact the conservation values of Bush Forever Site No. 290. The proposed clearing has been designed to avoid removal of remnant native vegetation with the exception of five large *Eucalyptus gomphocephala* trees and three of these are proposed to be retained (Phoenix, 2015b).

The application area is a cleared Pine (*Pinus pinaster*) plantation, where the native vegetation was cleared over 50 years ago to establish the plantation (GIS Database). The degraded condition of the native vegetation is due to the high numbers of weeds, rubbish and historical clearing (GIS Database). Given this, the proposed clearing is not likely to provide a significant ecological linkage or fauna movement corridor and is not likely to impact the environmental values of the conservation area.

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

Methodology GIS Database
Government of Western Australia (2000)
Keighery (1994)
Phoenix (2015b)

(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 the Priority One Gngangara Public Drinking Water Source Area and is within the area covered by the *Environmental Protection (Gngangara Mound Crown Land) Policy 1992* (GIS Database). The Department of Water (DoW) have considered the proposal and offer no comment. The application area is located within the proclaimed Swan River groundwater area under the *Rights in Water and Irrigation Act 1914* (GIS Database). Any groundwater extraction and/or taking or diversion of surface water for the purposes other than domestic and/or stock watering is subject to licence by the DoW.

There are no permanent or ephemeral water bodies located within the application area (GIS Database). The application area has a groundwater salinity that is fresh (<500 milligrams/Litre Total Dissolved solids (TDS)) (GIS Database). Although the proposed clearing may increase the amount of rainwater that infiltrates to the groundwater, given the nature of the overlying materials (ie. limestone ridges overlain by yellow or brown sand), the proposed clearing is not likely to adversely impact the quality of groundwater (Phoenix, 2015b). The proposed clearing is unlikely to deteriorate the quality of underground water (GIS Database).

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

Methodology GIS Database
Phoenix (2015b)

(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 watercourses or wetlands within the application area (GIS Database).

The vegetation is not growing in association with any low lying areas which may be prone to seasonal inundation (GIS Database). The soils within the application area comprise of limestone ridges overlain by yellow or brown sand (Phoenix, 2015b). The sandy and porous nature of the soils indicates that the application area is likely to be considered well drained. The proposed clearing is not likely to cause or increase the incidence of flooding.

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

Methodology GIS Database
Phoenix (2015b)

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

Comments

There are no Native Title claims over the area under application (GIS Database). However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process. Therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no known registered Aboriginal Sites of Significance located within the clearing permit application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

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

The clearing permit application was advertised on 15 June 2015 by the Department of Mines and Petroleum inviting submissions from the public. Two submissions were received in relation to the proposed clearing.

It is noted that the proposed clearing may impact on a protected matter under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The proponent may be required to refer the project to the (Federal) Department of Environment for environmental impact assessment under the EPBC Act. The proponent is advised to contact the Department of Environment for further information regarding notification and referral responsibilities under the EPBC Act.

Methodology GIS Database

4. References

Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.

Department of Parks and Wildlife (DPaW) (2015) NatureMap Department of Parks and Wildlife, viewed 9 July 2015

<<http://naturemap.dec.wa.gov.au>>.

- Environmental Protection Authority (EPA) (2000) Environmental Protection of Native Vegetation in Western Australia, Clearing of Native Vegetation, With Particular Reference to the Agricultural Area, Position Statement No. 2, Prepared by the Environmental Protection Authority, December 2000.
- Government of Western Australia (2000) Bush Forever Volumes 1 - 2. Western Australian Planning Commission, Perth WA.
- Government of Western Australia (2013) 2012 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of October 2012. WA Department of Environment and Conservation, Perth.
- Humphreys, W.F (2006) Aquifers: The ultimate groundwater-dependent ecosystems, *Australian Journal of Botany*, no. 54, pp. 115-132.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Mitchell, D., Williams, K. and Desmond, A (2002) Swan Coastal Plain 2 (SWA2 - Swan Coastal Plain subregion), In a Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Department of Conservation and Land Management, pp 606-623.
- Northcote, K. H., Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68): 'Atlas of Australian Soils, Sheets 1 to 10, with explanatory data'. CSIRO and Melbourne University Press: Melbourne.
- Phoenix Environmental Sciences (Phoenix) (2015a) Environmental baseline report for the proposed yellow sand quarry, Yancheop, M70/126 and M70/266. Prepared for Pinjar Metro Sands Pty Ltd, May 2015.
- Phoenix Environmental Sciences (Phoenix) (2015b) Native vegetation clearing permit application – supporting information. Yellow sand quarry, Yancheop, M70/126. Prepared for Pinjar Metro Sands Pty Ltd, May 2015.
- Phoenix Environmental Sciences (Phoenix) (2015c) CPS 6598/1 – Further information regarding Rainbow Bee-eaters and their Burrows. Internal correspondence, July 2015.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia (now DPaW and DER)
DER	Department of Environment Regulation, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DRF	Declared Rare Flora
DotE	Department of the Environment, Australian Government
DoW	Department of Water, Western Australia
DPaW	Department of Parks and Wildlife, Western Australia
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DotE)
EPA	Environmental Protection Authority, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
s.17	Section 17 of <i>the Environment Protection Act 1986</i> , Western Australia
TEC	Threatened Ecological Community

Definitions:

{DPaW (2013) Conservation Codes for Western Australian Flora and Fauna. Department of Parks and Wildlife, Western Australia}:-

T **Threatened species:**
Specially protected under the *Wildlife Conservation Act 1950*, listed under Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna or the Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora).

Threatened Fauna and Flora are further recognised by DPaW according to their level of threat using IUCN Red List criteria. For example Carnaby's Cockatoo *Calyptorhynchus latirostris* is specially protected under the *Wildlife Conservation Act 1950* as a threatened species with a ranking of Endangered.

Rankings:

CR: Critically Endangered - considered to be facing an extremely high risk of extinction in the wild.

EN: Endangered - considered to be facing a very high risk of extinction in the wild.

VU: Vulnerable - considered to be facing a high risk of extinction in the wild.

- X Presumed Extinct species:**
Specially protected under the *Wildlife Conservation Act 1950*, listed under Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora (which may also be referred to as Declared Rare Flora).
- IA Migratory birds protected under an international agreement:**
Specially protected under the *Wildlife Conservation Act 1950*, listed under Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice.
Birds that are subject to an agreement between governments of Australia and Japan, China and The Republic of Korea relating to the protection of migratory birds and birds in danger of extinction.
- S Other specially protected fauna:**
Specially protected under the *Wildlife Conservation Act 1950*, listed under Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice.
- P1 Priority One - Poorly-known species:**
Species that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, rail reserves and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.
- P2 Priority Two - Poorly-known species:**
Species that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.
- P3 Priority Three - Poorly-known species:**
Species that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.
- P4 Priority Four - Rare, Near Threatened and other species in need of monitoring:**
- (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.
 - (b) Near Threatened. Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.
 - (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.
- P5 Priority Five - Conservation Dependent species:**
Species that are not threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.