Government of Western Australia
Department of Mines, Industry Regulation and Safety

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 8162/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Hamersley Iron Pty Ltd**

1.3. Property details

Property: *Iron Ore (Hamersley Range) Agreement Act 1963,* Mineral Lease 4SA (AML 70/4)
Local Government Area: Shire of Ashburton
Colloquial name: Serpentine Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
15		Mechanical Removal	Mineral exploration and associated activities

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 4 October 2018

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description

The vegetation of the application area is broadly mapped as the following Beard vegetation association:
82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (GIS Database).

A flora and vegetation survey was conducted over the application area by a Rio Tinto botanist on the 16th – 18th September 2016 and 18th – 20th November 2016. The following vegetation associations were recorded within the application area (Hamersley Iron, 2018):

Vegetation of Hills and Slopes
S1: Low open woodland to scattered tall trees of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* over hummock grassland of *Triodia* sp. Robe River (M.E. Trudgen et al. MET 12367).

S2: Low open woodland of *Eucalyptus leucophloia* subsp. *leucophloia* with scattered *Corymbia hamersleyana* and *Hakea chordophylla* over open shrubland of *Acacia arida* and scattered *Acacia pyrifolia* over open hummock grassland of *Triodia wiseana* and *Triodia* sp. Robe River (M.E. Trudgen et al. MET 12367).

S3: Low open woodland of *Eucalyptus leucophloia* subsp. *leucophloia* over open hummock grassland of *Triodia wiseana* and *Triodia* sp. Robe River (M.E. Trudgen et al. MET 12367).

Vegetation of undulating slopes and low rises
U1: Low open woodland to scattered low trees of *Eucalyptus leucophloia* subsp. *leucophloia*, and *Corymbia deserticola* over tall open shrubland of *Acacia inaequilatera* over open hummock grassland of *Triodia wiseana*.

U2: Scattered low trees of *Eucalyptus leucophloia* subsp. *leucophloia* over open shrubland of *Acacia synchronicia* and *Acacia bivenosa* open shrubland over hummock grassland of *Triodia wiseana*.

Vegetation of gullies and gorges
G1: Low woodland of *Acacia citrinoviridis* and *Corymbia ferriticola* over open shrubland of *Dodonaea pachyneura* and *Eremophila latrobei* subsp. *glabra* over very open tussock grassland of *Triodia* sp. Robe River (M.E. Trudgen et al. MET 12367), *Eriachne mucronata, Cymbopogon ambiguus* and *Aristida burbidgeae*.

G2: Open woodland of *Corymbia ferriticola* with scattered *Grevillea berryana* over open shrubland of *Acacia hamersleyensis* and *Eremophila latrobei* subsp. *glabra* over open hummock grassland of *Triodia wiseana* over very open tussock grassland of *Eriachne mucronata*, *Cymbopogon ambiguus* and *Aristida burbidgeae*.

Vegetation of rocky breakaway faces
R1: Low open woodland of *Corymbia ferriticola, Eucalyptus leucophloia, Acacia citrinoviridis* and *Grevillea berryana* over open shrubland of *Eremophila latrobei* subsp. *glabra, Acacia hamersleyensis and Astrotricha hamptonii* over open hummock grassland of *Triodia wiseana* and *Triodia* sp. Robe River (M.E. Trudgen et al. MET 12367) over scattered tussock grasses of *Cymbopogon ambiguus* and *Eriachne mucronata*.

Vegetation of drainage lines

D1: Low open woodland of *Eucalyptus leucophloia* and *Corymbia hamersleyana* over tall shrubland of *Acacia citrinoviridis, Acacia monticola, Petalostylis labicheoides* and *Gossypium robinsonii* over open hummock grassland of *Triodia wiseana* and *Triodia* sp. Robe River (M.E. Trudgen et al. MET 12367).

D2: Low open woodland of *Eucalyptus leucophloia* and *Corymbia hamersleyana* over shrubland of *Acacia monticola, Acacia arida, Acacia pyrifolia, Indigofera* sp. Bungaroo Creek (S. van Leeuwen 4301), *Petalostylis labicheoides, Senna glutinosa* subsp. *glutinosa* and *Stylobasium spathulatum* over open hummock grassland of *Triodia wiseana* and *Triodia* sp. Robe River (M.E. Trudgen et al. MET 12367) over scattered tussock grasses of *Cymbopogon ambiguus*.

D3: Scattered low trees of *Eucalyptus leucophloia* over tall shrubland of *Eucalyptus socialis* subsp. *eucentrica* mallees and *Gossypium robinsonii* over open shrubland of *Petalostylis labicheoides* and *Acacia bivenosa* over open hummock grassland of *Triodia wiseana* and *Triodia angusta*.

Clearing Description

Serpentine Project.
Hamersley Iron Pty Ltd proposes to clear up to 15 hectares of native vegetation within a boundary of approximately 381 hectares, for the purpose of mineral exploration and associated activities. The project is located approximately 84 kilometres south of Pannawonica, within the Shire of Ashburton.

Vegetation Condition

Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994);

to

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

Comment

The vegetation condition was derived from a vegetation survey conducted by a Rio Tinto botanist (2018), which was based on the Trudgen vegetation condition scale (1988).

The proposed clearing is for resource evaluation / mineral exploration, geotechnical and associated activities for the Serpentine Project. The application area intersects an existing permit which was granted for the construction of an access track.

3. Assessment of application against Clearing Principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments

Proposal may be at variance to this Principle

The clearing permit application area is located within the Hamersley subregion of the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion (GIS Database). This subregion is characterised by Mulga (*Acacia aneura*) low woodland over bunch grasses on fine textured soils in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* hummock grasslands on skeletal sandy soils (CALM, 2002).

The condition of the vegetation was classified as 'Excellent' to 'Completely Degraded' (Hamersley Iron, 2018). No Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) were recorded within the application area (Hamersley Iron, 2018; GIS Database).

A Rio Tinto botanist undertook a flora and vegetation survey over the application area (Hamersley Iron, 2018). A total of 114 taxa from 68 genera representing 38 families were recorded during the survey. No species of Threatened flora have been recorded within the application area (Hamersley Iron, 2018; GIS Database). There were six species of Priority flora recorded during the flora survey:

- *Sida* sp. Hamersley Range (K. Newbey 10692) (Priority 1);
- *Hibiscus* aff. sp. Gurinbiddy Range (M.E. Trudgen MET 15708) (Priority 2);
- *Indigofera* sp. Bungaroo Creek (S. van Leeuwen 4301) (Priority 3);
- *Pleurocarpaea gracilis* (Priority 3);
- *Triodia* sp. Robe River (M.E. Trudgen et al. MET 12367) (Priority 3); and
- *Rhynchosia bungarensis* (Priority 4).

Sida sp. Hamersley Range (K. Newbey 10692) was recorded from seven locations during the survey. This species was recorded from rocky blowouts and breakaways (Hamersley Iron, 2018) and are known to usually occur at the base of ironstone cliffs or breakaways in high altitude areas (WAH, 2018). The Western Australian Herbarium has 15 specimens within their collections (WAH, 2018).

Hibiscus aff. sp. Gurinbiddy Range (M.E. Trudgen MET 15708) occurs at the base of breakaways, cliff lines and gullies on ironstone hills (WAH, 2018). During the survey, this species was recorded from five locations (Hamersley Iron, 2018). There are 18 specimens of this species within the collections at the Western Australian Herbarium (WAH, 2018).

Pleurocarpaea gracilis usually occurs in sheltered situations on the upper slopes of ironstone hills (WAH, 2018), and was only recorded from a single location during the survey (Hamersley Iron, 2018). This species has a total population count of 19 plants from only three records within the Rio Tinto database (Hamersley Iron, 2018). There are 11 specimens of this species within the collections at the Western Australian Herbarium

(WAH, 2018).

Priority flora species *Sida* sp. Hamersley Range (K. Newbey 10692), *Hibiscus* aff. sp. Gurinbiddy Range (M.E. Trudgen MET 15708) and *Pleurocarpaea gracilis* are considered to be of high conservation significance due to their restricted habitats and relatively low numbers in current records. Any clearing to these species would be considered significant to the conservation of these species. Potential impacts to these flora may be minimised by the implementation of a flora management condition.

Priority flora species *Indigofera* sp. Bungaroo Creek (S. van Leeuwen 4301), *Triodia* sp. Robe River (M.E. Trudgen et al. MET 12367) and *Rhynchosia bungarensis* have reasonably broad distributions within the Pilbara region and relatively significant numbers in existing records. The Western Australian Herbarium also has a relatively high number of specimens for each of these species within their collections (WAH, 2018). The proposed clearing of 15 hectares within approximately 381 hectares is not expected to significantly impact these species at a regional scale.

Eleven vegetation associations were recorded from the application area (Hamersley Iron, 2018). Two of the vegetation associations, G1 and G2, were considered to be of significance (Hamersley Iron, 2018). These vegetation associations were recorded from gullies and are of moderate significance, due to the habitat providing refugia for fire sensitive species and other species that prefer rocky, mesic habitats (Hamersley Iron, 2018). These vegetation associations are not restricted to the application area and are widely distributed across the Hamersley Ranges. The proposed clearing of 15 hectares within approximately 381 hectares is unlikely to significantly impact the vegetation associations.

A fauna desktop assessment was undertaken by conducting a search on the DBCA's NatureMap database, which identified five amphibians, 69 reptiles, 74 avifauna and 19 mammals that may potentially occur within the application area (Hamersley Iron, 2018). This fauna diversity is expected from the area and is not considered to represent a higher level of biological diversity than surrounding areas.

A fauna habitat assessment was also undertaken during the flora and vegetation survey (Hamersley Iron, 2018). Broad fauna habitats were identified and mapped based on landforms and vegetation associations identified during the survey. Five broad habitat types were described from the application area, 'Hills and Slopes', 'Undulating slopes and low rises', 'Breakaway', 'Drainage Lines' and 'Gullies/Gorge' (Hamersley Iron, 2018). The application area supports a moderately diverse group of fauna, including conservation significant fauna, but these are not restricted to the application area and occur within the broader region (Hamersley Iron, 2018). The proposed clearing is unlikely to have a significant impact on these faunal diversity at a regional scale.

There were no weed species identified within the application area during the survey (Hamersley Iron, 2018). Weeds have the potential to significantly change the dynamics of a natural ecosystem and lower the biodiversity of an area. Potential impacts to the biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

The application area is not likely to comprise a greater diversity than nearby and similar areas with the bioregion and local area.

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

Methodology

CALM (2002)
Hamersley Iron (2018)
WAH (2018)

GIS Database:
- IBRA Australia
- Threatened and Priority Flora
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers

(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 may be at variance to this Principle

The following five fauna habitats have been recorded within the application area (Hamersley Iron, 2018):

- Hills and Slopes;
- Undulating slopes and low rises;
- Breakaway;
- Drainage lines; and
- Gullies/Gorge.

Two fauna habitats, 'Breakaway' and 'Gullies/Gorge' habitats, were considered to be significant microhabitats

for conservation significant species (Hamersley Iron, 2018). 'Breakaway' habitat covers 2.1 hectares (0.9%) of the application area, whereas the 'Gullies/Gorge' habitat covers 12.2 hectares (5.3%) of the application area. These habitats may provide habitat for conservation significant species such as the Northern Quoll, Pilbara Leaf-Nosed bat and Ghost bat. There is minimal breakaway habitat within the application area, and caves encountered within the application area are not considered to be significant as they were observed as not being significantly deep (Hamersley Iron, 2018). The species distribution for Ghost bats and Pilbara Leaf-Nosed bats is strongly influenced by the availability of suitable roost caves which require large caves, rather than habitat type (Hamersley Iron, 2018). Given the limited habitat, absence of large caves and the relatively small scale of the proposed clearing, it is unlikely that these species are dependent on the habitats within the application area.

The Northern Quoll has the potential to occur within the application area, however, the majority of the application area consists of 'Undulating slopes and low rises' with minimal denning or foraging habitat for the Northern Quoll. It is unlikely the proposed clearing will significantly impact this species at a local or regional scale.

Two Western Pebble-mound Mouse mounds were recorded during the survey (Hamersley Iron, 2018). The mounds were considered to be recently inactive mounds, i.e. covered in some vegetation and had slightly lost their dome formation. These mounds were considered unlikely to have been inhabited in recent years. Due to the relatively small scale of the proposed clearing, it is unlikely that the proposed clearing will significantly impact this species at a local or regional scale.

The fauna habitats recorded within the application area are well represented within the region. The proposed clearing of up to 15 hectares within an application area of approximately 381 hectares is unlikely to have a significant impact on fauna habitat availability at a regional scale.

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

Methodology Hamersley Iron (2018)

(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**

There are no known records of Threatened flora within the application area (GIS Database). Flora surveys of the application area did not record any species of Threatened flora (Hamersley Iron, 2018).

The vegetation associations within the application area are common and widespread within the region (Hamersley Iron, 2018; GIS Database), and the vegetation proposed to be cleared is unlikely to be necessary for the continued existence of any species of Threatened (rare) flora.

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

Methodology Hamersley Iron (2018)

GIS Database:
- Pre-European Vegetation
- Threatened and Priority Flora

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

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

There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the application area (GIS Database). The nearest TEC to the application is the '*Themeda* grasslands on cracking clays (Hamersley Station)', with the buffer boundary located approximately 68 kilometres east of the application area (GIS Database).

A flora and vegetation survey of the application area did not identify any TECs (Hamersley Iron, 2018).

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

Methodology Hamersley Iron (2018)

GIS Database:
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers

(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 Pilbara Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 99% of the pre-European vegetation still exists in the Pilbara IBRA Bioregion (Government of Western Australia, 2018). The application area is broadly mapped as Beard vegetation association 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (GIS Database). Approximately 99% of the pre-European extent of this vegetation association remains uncleared at both the state and bioregional level (Government of Western Australia, 2018).

Therefore, the application area does not represent a significant remnant of native vegetation in an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in DBCA managed lands
IBRA Bioregion – Pilbara	17,808,657	17,733,583	~99	Least Concern	10.12
Beard vegetation associations – WA					
82	2,565,901	2,553,217	~99	Least Concern	11.52
Beard vegetation associations – Pilbara Bioregion					
82	2,563,583	2,550,898	~99	Least Concern	11.53

* Government of Western Australia (2018)
** 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)
Government of Western Australia (2018)

GIS Database:
- IBRA Australia
- 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

There are no permanent watercourses or water bodies mapped within the area under application (GIS Database). Minor, non-perennial watercourses are present within the application area and riparian vegetation was mapped in association with these watercourses (Hamersley Iron, 2018; GIS Database). Clearing within these areas have the potential to cause localised erosion, however, it is not expected that the proposed clearing will significantly impact these watercourses due to small scale of the proposed clearing.

Based on the above, the proposed clearing is at variance to this Principle**.** Potential impacts to vegetation growing in association with the watercourse may be minimised by the implementation of a watercourse management condition.

Methodology

Hamersley Iron (2018)

GIS Database:
- Hydrography, Lakes
- 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

The application area lies within the Newman land system (GIS Database). This land system has been mapped

and described in technical bulletins produced by the former Department of Agriculture (now the Department of Primary Industries and Regional Development).

The Newman land system consists of rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands (Payne et al., 1988). This land system is not generally susceptible to erosion (Payne et al., 1988).

Given the relatively small scale of clearing for exploration activities, the proposed clearing is not likely to cause appreciable land degradation.

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

Methodology Payne et al (1988)

GIS Database:
- Landsystem Rangelands

(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**

There are no conservation areas in the vicinity of the application area. The nearest DBCA (formerly DPaW) managed land is the Cane River Conservation Park which is located approximately 88 kilometres north west of the application area (GIS Database). The proposed clearing is unlikely to impact on the environmental values of any conservation area.

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

Methodology GIS Database:
- DPaW Tenure

(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**

There are no Public Drinking Water Source Areas within or in close proximity to the application area (GIS Database). There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database). Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall. The proposed clearing is unlikely to result in significant changes to surface water flows.

The proposed clearing of 15 hectares within a boundary of approximately 381 hectares is unlikely to cause deterioration in the quality of underground or surface water.

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

Methodology GIS Database:
- Hydrography, Linear
- Public Drinking Water Source Areas

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

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

The climate of the region is semi-arid, with an average rainfall of approximately 407 millimetres per year (BoM, 2018). Annual rainfall is variable with tropical lows producing large regional rainfall events to isolated thunderstorm events in the dry season (Hamersley Iron, 2018), therefore drainage lines in the area are dry for most of the year, only flowing briefly immediately following significant rainfall.

There are no permanent water courses or waterbodies within the application area (GIS Database). Seasonal drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events. However, the proposed clearing is unlikely to increase the incidence or intensity of natural flooding events.

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

Methodology BOM (2018)

Hamersley Iron (2018)

GIS Database:
- Hydrography, lakes
- Hydrography, linear

Planning Instrument, Native Title, previous EPA decision or other matter.

Comments

The clearing permit application was advertised on 27 August 2018 by the Department of Mines, Industry Regulation and Safety (DMIRS), inviting submissions from the public. No submissions were received in relation to this application.

There is one Native Title claim over the area under application (DPLH, 2018). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. 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 registered Aboriginal Sites of Significance within the application area (DPLH, 2018). 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 Water and Environmental Regulation and the Department of Biodiversity Conservation and Attractions, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

Methodology DPLH (2018)

4. References

BOM (2018) Climate statistics for Australia locations – Pannawonica, Bureau of Meteorology. www.bom.gov.au/climate/averages/tables/cw_005069.shtml (Accessed 28 September 2018).

CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.

DPLH (2018) Aboriginal Heritage Enquiry System. Department of Planning, Lands and Heritage. http://maps.daa.wa.gov.au/AHIS/ (Accessed 28 September 2018).

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.

Government of Western Australia (2018) 2017 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of December 2017. WA Department of Biodiversity, Conservation and Attractions. https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics

Hamersley Iron (2018) Flora, Vegetation and Fauna Habitat Assessment at Serpentine. Native Vegetation Clearing Permit – Supporting Report. Hamersley Iron Pty Ltd, March 2017.

Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Payne, A.L., Mitchell, A.A., and Holman W.F. (1988) An Inventory and Condition Survey of Rangelands in the Ashburton River Catchment, Western Australia. Department of Agriculture, Western Australia.

Trudgen, M.E. (1988) A report on the Flora and Vegetation of the Port Kennedy Area. Unpublished report prepared for Bowman Bishaw and Associates, West Perth.

Western Australian Herbarium (1998 -). FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. https://florabase.dpaw.wa.gov.au/ (Accessed 3 October 2018).

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia (now DPLH)
DAFWA	Department of Agriculture and Food, Western Australia (now DPIRD)
DBCA	Department of Biodiversity Conservation and Attractions, Western Australia
DEC	Department of Environment and Conservation, Western Australia (now DBCA and DWER)
DEE	Department of the Environment and Energy, Australian Government
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia
DMP	Department of Mines and Petroleum, Western Australia (now DMIRS)

DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora
DoE	Department of the Environment, Australian Government (now DEE)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DEE)
DWER	Department of Water and Environmental Regulation, Western Australia
EPA	Environmental Protection Authority, Western Australia
EP Act	*Environmental Protection Act 1986*, Western Australia
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	*Rights in Water and Irrigation Act 1914*, Western Australia
TEC	Threatened Ecological Community

Definitions:

{DPaW (2017) Conservation Codes for Western Australian Flora and Fauna. Department of Parks and Wildlife, Western Australia}:-

T **Threatened species:**
Published as Specially Protected under the *Wildlife Conservation Act 1950,* listed under Schedules 1 to 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora).

Threatened fauna is that subset of 'Specially Protected Fauna' declared to be 'likely to become extinct' pursuant to section 14(4) of the *Wildlife Conservation Act 1950*.

Threatened flora is flora that has been declared to be 'likely to become extinct or is rare, or otherwise in need of special protection', pursuant to section 23F(2) of the *Wildlife Conservation Act 1950*.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR **Critically endangered species**
Threatened species considered to be facing an extremely high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.

EN **Endangered species**
Threatened species considered to be facing a very high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.

VU **Vulnerable species**
Threatened species considered to be facing a high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.

EX **Presumed extinct species**
Species which have been adequately searched for and there is no reasonable doubt that the last individual has died. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora.

IA **Migratory birds protected under an international agreement**
Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice.

CD **Conservation dependent fauna**

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice.

OS **Other specially protected fauna**
Fauna otherwise in need of special protection to ensure their conservation. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice.

P **Priority species**
Species which are poorly known; or
Species that are adequately known, are rare but not threatened, and require regular monitoring. Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

P1 **Priority One - Poorly-known species:**
Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

P2 **Priority Two - Poorly-known species:**
Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

P3 **Priority Three - Poorly-known species:**
Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations 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 locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

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 are close to qualifying for Vulnerable, but are not listed as Conservation Dependent.
(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.