



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 8147/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Saracen Metals Pty Ltd

1.3. Property details

Property: Mining Lease 37/46
Mining Lease 37/219
Mining Lease 37/564
Mining Lease 37/902
Mining Lease 37/955
Mining Lease 37/986

Local Government Area: Shire of Leonora
Colloquial name: Kailis Project

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 27 September 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 associations:
18: Low woodland; mulga (*Acacia aneura*); and
28: Open low woodland; mulga. (GIS Database).

A flora survey covering the Kailis area was undertaken by Mattiske Consulting Pty Ltd (2008) in November 2007. During November 2014, environmental scientists employed by St Barbara conducted a floristic survey to the south of the Kailis Central pit, to extend the dataset gathered during the 2007 Mattiske flora survey (Saracen, 2018). Based from these surveys, six broad vegetation types have been identified within the application area:

- A1: Woodland of *Acacia aneura* var. *aneura* and *Acacia craspedocarpa* over *Acacia tetragonophylla*, *Santalum lanceolatum* and *Eremophila longifolia* shrubs, over *Ptilotus obovatus* and *Eremophila* spp. over *Enneapogon caerulescens* and other grasses on flow lines.
- A2: Shrubland of *Acacia ayersiana* and *Acacia aneura* var. *aneura* over *Acacia tetragonophylla* tall shrubs over *Eremophila forrestii* subsp. *forrestii*, *Eremophila platycalyx* subsp. *platycalyx* shrubs and *Dianella revoluta* over *Ptilotus obovatus* and Poaceae spp. on clay flats with patches of stony mantle.
- A3: Open Shrubland of *Acacia aneura* var. *aneura*, *Acacia aneura* var. *intermedia* and *Acacia ayersiana* over *Acacia tetragonophylla* over *Eremophila forrestii* subsp. *forrestii*, *Eremophila platycalyx* subsp. *platycalyx*, *Ptilotus obovatus*, *Solanum lasiophyllum* over *Eragrostis eriopoda* and *Aristida contorta* on flats and lower slopes on red/brown clay loams with quartz and ironstone mantles.
- A4: Open Shrubland of *Acacia aneura* var. *aneura* and *Acacia ayersiana* over *Acacia tetragonophylla* over *Eremophila platycalyx* subsp. *platycalyx*, *Ptilotus obovatus*, *Maireana triptera* over *Enneapogon caerulescens*, *Cymbopogon ambiguus* on red/brown clay loams on lower slopes and flats.
- A5: Open Shrubland of *Acacia aneura* var. *aneura*, *Acacia aneura* var. *conifera* over *Acacia tetragonophylla* and *Acacia victoriae* over *Eremophila platycalyx* subsp. *platycalyx*, *Ptilotus obovatus* and *Solanum lasiophyllum* over *Aristida contorta*, *Maireana triptera* and *Sclerolaena cuneata* on red/brown clay on slopes with scattered patches of quartz and calcrete.
- A6: Open Shrubland of *Acacia aneura* var. *fuliginea* and *Acacia jamesiana* over *Acacia*

tetragonophylla over *Eremophila platycalyx* subsp. *platycalyx*, *Scaevola spinescens*, *Senna artemisioides* subsp. *filifolia*, *Atriplex nummularia*, *Ptilotus obovatus* over *Maireana ?triptera* and grasses on red/brown clays on rises with calcrete and quartz.

Clearing Description	Kailis Project. Saracen Metals Pty Ltd (Saracen) proposes to clear up to 50 hectares of native vegetation within a boundary of approximately 439.6 hectares, for the purpose of mineral production. The project is located approximately 4 kilometres north-west of Leonora, within the Shire of Leonora.
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 vegetation condition was derived from a vegetation survey conducted by Mattiske Consulting Pty Ltd (2008) and via imagery of the application area (GIS Database). Clearing Permit CPS 6918/1 was granted to Saracen Metals Pty Ltd on 24 March 2016, approving clearing of native vegetation for Stage 1 of the Kailis Project which included a cutback of the original pit shell and construction of an additional waste rock dump to the south of the open pit. CPS 6918/1 expired on 30 May 2018, and Saracen is proposing the reinstate 50 hectares of disturbance under CPS 8147/1 to accommodate Stage 2 mining within the same boundary.

3. Assessment of application against Clearing Principles

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

Comments	<p>Proposal is not likely to be at variance to this Principle</p> <p>The clearing permit application area is located within the Eastern Murchison subregion of the Murchison Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion (GIS Database). The Eastern Murchison subregion is characterised by internal drainage and extensive areas of elevated red desert sandplains with minimal dune development (CALM, 2002). Vegetation of the subregion is dominated by Mulga woodlands (often rich in ephemerals), hummock grasslands, saltbush shrublands and samphire shrublands (CALM, 2002). Pastoral grazing occurs over a vast majority of the subregion, and consequently, much of the subregion has been severely degraded by feral herbivores. Mining for gold and nickel in the region is considerable, with most mining tenements occurring on pastoral land (Pringle et al., 1994).</p> <p>The proposed clearing area is partially located on the Braemore Pastoral Station (Saracen, 2018) and therefore expected to be overgrazed. Much of the area has also been subject to historical disturbances from mining activity, with open cut pits, waste rock landforms, access tracks and various other cleared areas present on site (Saracen, 2018; GIS Database). Mattiske Consulting Pty Ltd (2008) conducted a flora and vegetation survey over the application area and identified 76 taxa, from 32 genera and 19 families in the area. The vegetation assemblages recorded from the area are not significant in a local or regional context, and none are protected under legislation (Pringle et al., 1994). All the vegetation assemblages are dominated by <i>Acacia aneura</i> and differences in these are generally due to the density of <i>A. aneura</i> and dominance of understorey shrubs (Saracen, 2018).</p> <p>There are no known Threatened Flora or Priority flora species, Threatened Ecological Communities or Priority Ecological Communities recorded within the application area (Mattiske Consulting Pty Ltd, 2008; Saracen, 2018; GIS Database).</p> <p>No Weeds of National Significance or Declared Pests under the <i>Biosecurity and Agricultural Management Act 2007</i> were recorded during the survey, however three introduced flora taxa were recorded (Mattiske Consulting Pty Ltd, 2008). The proposed vegetation clearing has the potential to introduce weed species into the local area should adequate hygiene practices not be put in place. Weeds can affect biodiversity in a number of ways, including out competing native species for resources and increasing fire risk. The potential spread of introduced species as a result of the proposed clearing may be minimised by the implementation of a weed management condition.</p> <p>A Level 1 fauna survey was conducted by Bamford Consulting Ecologists (Bamford) over the application area in January 2008 (Bamford, 2008). From a faunal perspective, the proposed clearing area contains habitats that are widespread in a regional context and are not deemed to be significant (Bamford, 2008). The assemblage of vertebrate fauna expected in the survey area is typical of the Eastern Murchison subregion. Some species of conservation significance may utilise habitats in the proposed clearing area from time to time, but none would be dependent on the area (Bamford, 2008).</p> <p>Based on the above, the proposed clearing is not likely to be at variance to this Principle.</p>
Methodology	Bamford (2008)

CALM (2002)
Mattiske Consulting Pty Ltd (2008)
Pringle et al. (1994)
Saracen (2018)

GIS Database:

- IBRA Australia
- Imagery
- Pre-European Vegetation
- 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

Bamford (2008) undertook a Level 1 fauna assessment of the Kailis Project area in January 2008. Desktop database searches and literature reviews were conducted to provide an inventory of species potentially occurring in the project area. Field reconnaissance was undertaken on 14 and 15 January 2008 to describe the habitat values of the site, to search for species of conservation significance, to describe potential impacts of vegetation clearing and to make recommendations to minimise, mitigate and manage impacts to fauna.

Bamford (2008) recorded eight major habitats within the survey area, five of which are present within the proposed clearing area:

1. Gently undulating stony plains supporting sparse Mulga over chenopod shrubland;
2. Mulga woodland on hardpan;
3. Major incised creekline supporting dense Mulga woodland and fringing riparian vegetation;
4. Minor drainage tracts supporting Mulga woodland; and
5. Low lying floodplains and depressions supporting halophytic chenopod shrubland.

Habitat 1 is the most extensive habitat in the project area and is widespread in the Leonora region (Bamford, 2008). A large proportion of this habitat in the project area has been disturbed by previous mining activities. The proposed clearing of this habitat is not likely to be significant given the level of degradation and widespread nature of the habitat.

Habitat 2 is also widespread in the region but is likely to support higher species than Habitat 1 due to a relatively high vegetation cover in comparison to the surrounding landscape. This habitat includes minor drainage areas.

Habitat 3 is uncommon within the Leonora area and is considered a distinctive habitat that provides corridors for movement of fauna across the landscape (Bamford, 2008). The drainage tract also contains seasonal pools which provide an important resource after rainfall for many nomadic and uncommon species, and provides breeding opportunities for local fauna (Bamford, 2008). Some conservation significant species may occur in this habitat such as mygalomorph spiders. The small area, linkage function, concentration of biodiversity and possibility of the area being utilised by conservation significant species make this habitat type moderate to high in conservation significance (Bamford, 2008). Potential impacts to this habitat may be minimised by the implementation of a vegetation management condition and a restricted clearing condition.

Habitat 4 is well represented within the region, although occurs as small and linear areas in the project area (Bamford, 2008). This habitat type may support some species of conservation significance including mygalomorph spiders and specialist burrowing fauna species including short range endemics. Fauna diversity and abundance is likely to be relatively high due to the increased vegetation cover associated with this habitat. Potential impacts to this habitat may be minimised by the implementation of a vegetation management condition and a restricted clearing condition.

Habitat 5 is well represented outside of the application area, and the proposed impact by the disturbance footprint is small. This habitat type has the potential to support a number of migratory species, however the small areas occurring within the Kailis project area are unlikely to support conservation significant vertebrates (Bamford, 2008). In the Leonora area, this habitat type is usually found around the vicinity of Lake Raeside which is located approximately 7.5 kilometres south west of the application area (Saracen, 2018).

Impacts associated with vegetation clearing are likely to include (Bamford, 2008):

- Loss of habitat for foraging and shelter;
- Habitat fragmentation;
- Mortality during clearing operations;
- Alteration of local hydrology;

- Alteration of natural fire regime; and
- Disturbance from noise and dust.

Overall, Bamford (2008) concluded that the assemblage of vertebrate fauna expected in the survey area is typical of the Eastern Murchison subregion. Most species expected are widespread, however a few may have restricted or limited habitat distributions. The survey area contains mostly widespread and common habitats, apart from one significant habitat which should remain undisturbed, the major incised creekline. Potential impacts to this habitat type may be minimised by the implementation of a vegetation management condition and a restricted clearing condition.

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

Methodology Bamford (2008)
Saracen (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 (Mattiske Consulting Pty Ltd, 2008).

The vegetation communities appear to be affected by grazing or previous mining/exploration activity and none are significant in the region or locally (Saracen, 2018). 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 Mattiske Consulting Pty Ltd (2008)
Saracen (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).

A flora and vegetation survey of the application area did not identify any TECs (Mattiske Consulting Pty Ltd, 2008).

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

Methodology Mattiske Consulting Pty Ltd (2008)

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 Murchison Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 99% of the pre-European vegetation still exists in the IBRA Murchison Bioregion (Government of Western Australia, 2018). The application area is broadly mapped as Beard vegetation associations 18: Low woodland; mulga (*Acacia aneura*); and 28: Open low woodland; mulga (GIS Database). Approximately 98% to 99% of the pre-European extent of each of these vegetation associations 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 – Murchison	28,120,586	28,044,823	~99	Least Concern	7.78
Beard vegetation associations – WA					
18	19,892,306	19,843,729	~99	Least Concern	6.62
28	395,895	392,171	~99	Least Concern	-
Beard vegetation associations – Murchison Bioregion					
18	12,403,172	12,363,252	~99	Least Concern	4.96
28	224,291	220,583	~98	Least Concern	-

* 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 wetlands within the area proposed to clear (GIS Database). The only permanent surface water present is exposure of the groundwater table in the open pit (Saracen, 2018).

A major incised creekline and two minor creeklines are present within the north and south of the application area. The vegetation community 'A1: Woodland of *Acacia aneura* var. *aneura* and *Acacia craspedocarpa* over *Acacia tetragonophylla*, *Santalum lanceolatum* and *Eremophila longifolia* shrubs, over *Ptilotus obovatus* and *Eremophila* spp. over *Enneapogon caerulescens* and other grasses on flow lines' has been identified as growing in an environment associated with a watercourse (Mattiske Consulting Pty Ltd, 2008; GIS Database). This vegetation community is located around both creeklines.

The major incised creekline is considered a distinctive habitat that provides corridors for movement of fauna across the landscape (Bamford, 2008). The drainage tract also contains seasonal pools which provide an important resource after rainfall for many nomadic and uncommon species, and also provides breeding opportunities for local fauna (Bamford, 2008).

Given this vegetation community is associated with a watercourse, 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 vegetation management condition and a restricted clearing condition.

Methodology Bamford (2008)
Mattiske Consulting Pty Ltd (2008)

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 may be at variance to this Principle

Land system mapping by the former Department of Agriculture (now the Department of Primary Industries and Regional Development) has mapped the proposed clearing area as the Gundockerta Land System, with a small portion within the boundary of the Rainbow land system (GIS Database).

The Gundockerta land system is characterised by extensive, gently undulating stony plains supporting bluebush shrublands. Saline plains and adjacent alluvial tracts are susceptible to water erosion where the stony mantle is absent and/or vegetation cover is reduced. The vegetation of this land system is highly preferred for grazing by introduced and native mammals, rendering it susceptible to overgrazing and consequent degradation (Pringle et al., 1994).

The Rainbow land system is characterised by hardpan plains supporting Mulga shrublands. Alluvial plains are typically subject to sheet flow and are often characterised by the fine ironstone gravel mantles and sparse, generally narrow and unincised concentrated drainage tracts. The Rainbow land system is generally not susceptible to soil erosion; however impedance of sheet flow can initiate soil erosion and cause water starvation of vegetation downslope (Pringle et al., 1994).

Changes to the natural landscape have already been made from historic mining and activities of Stage 1 of the Project (GIS Database). Potential impacts from erosion as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

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

Methodology Pringle et al. (1994)
Saracen (2018)

GIS Database:
- Imagery
- 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 (GIS Database). According to available databases, the nearest conservation area is an un-named 'C class' nature reserve, located approximately 61 kilometres south-south east of the proposed clearing area. 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). The groundwater table has been exposed in the existing Kailis Pit, and the water is saline (20,000 – 45,000 mg/L TDS) like much of the groundwater around Leonora (Saracen, 2018; GIS Database). Previous mining activity in the area has not resulted in any significant alteration to groundwater quality. Dewatering activities will be undertaken during the pre-mining and mining operation to reduce the groundwater level in the pit and allow for safe mining. Dewatering is not expected to impact vegetation in the area as rooting depth is unlikely to extend to more than 10 metres and vegetation is unlikely to be dependent on saline groundwater (Saracen, 2018).

There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database). Creek lines are present within the north and south of the application area. These watercourses flow very rarely, with very limited flow duration approximating the length of the storm from which it was generated (Mattiske Consulting Pty Ltd, 2008). The proposed clearing is unlikely to result in significant changes to surface water flows.

The proposed clearing is unlikely to cause deterioration in the quality of surface water or underground water.

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

Methodology Mattiske Consulting Pty Ltd (2008)
Saracen (2018)

GIS Database:
- Groundwater Salinity, Statewide
- 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 proposed clearing area is located approximately four kilometres north-west of Leonora (GIS Database). Leonora is located in an arid environment with an average annual rainfall of approximately 237.5 millimetres (BoM, 2018). Heavy rainfall events are occasionally experienced from remnants of tropical cyclones (Saracen, 2018).

The Kailis pit has been identified as the main flooding risk, as the local topography drains away from the highway towards bushland and that short duration of flooding events are typically experienced in the area (Saracen, 2018). Suitable stormwater diversion levees will be installed around the perimeter of the facility to eliminate the potential flooding hazard to the pit (Saracen, 2018).

The proposed clearing of 50 hectares of native vegetation is not expected to increase the incidence or intensity of natural flood events given the area to be cleared in relation to the size of the Raeside-Ponton catchment, which is 11,589,532 hectares (GIS Database).

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

Methodology BOM (2018)
Saracen (2018)

GIS Database:
- Hydrographic Catchments - Catchments

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. One submission was received in relation to this application, raising concerns over potential impacts to Aboriginal Sites of Significance.

There is one native title claim over the area under application (GIS Database). This claim (WAD142/2018) has been filed at the Federal Court. 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 is one registered Aboriginal Sites of Significance within the application area (DPLH, 2018). A heritage survey was conducted in March 2016 and identified 'Kailis 1 Archaeological Site', consequently Saracen amended the Project layout to ensure that the margin of the southern waste rock dump did not encroach on this area (Saracen, 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)

GIS Database:
- Native Title Claims

4. References

- Bamford (2008) Fauna Assessment of the Kailis Project. Report prepared for St Barbara Limited by Bamford Consulting Ecologists, 20 February 2008.
- BoM (2018) Climate statistics for Australia locations – Leonora, Bureau of Meteorology, http://www.bom.gov.au/climate/averages/tables/cw_012046.shtml (Accessed 21 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 21 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>
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Mattiske Consulting Pty Ltd (2008) Flora and Vegetation Survey of the Kailis - Trump and Poker - Forrest Lease Areas. Report prepared for St Barbara Limited by Mattiske Consulting Pty Ltd, March 2008.
- Pringle, H.J., Van Vreeswyk, A.M., & Gilligan, S.A. (1994) Technical Bulletin No. 87: An inventory and condition survey of the north-eastern Goldfields, Western Australia. Department of Agriculture, South Perth, Western Australia.
- Saracen (2018) Kailis Project – Native Vegetation Clearing Permit Application: Clearing Permit Application Supporting Documentation. Saracen Metals Pty Ltd, Western Australia, July 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	<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
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 <i>Wildlife Conservation Act 1950</i> , 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
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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.