



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 8048/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: Wodgina Lithium Pty Ltd

### 1.3. Property details

Property: Miscellaneous Licence 45/93  
Miscellaneous Licence 45/437  
Local Government Area: Town of Port Hedland  
Colloquial name: Wodgina Lithium Project

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
122.9		Mechanical Removal	An airstrip and supporting infrastructure

### 1.5. Decision on application

Decision on Permit Application: Grant  
Decision Date: 26 July 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 permit application area is broadly mapped as the following Beard vegetation association:

93: Hummock grasslands, shrub steppe, kanji over soft spinifex (GIS Database).

A single season reconnaissance flora and vegetation survey was conducted over the permit application area by 360 Environmental from 12<sup>th</sup> – 17<sup>th</sup> December 2017. A detailed flora and vegetation survey was conducted over the same survey area by 360 Environmental from 9<sup>th</sup> – 16<sup>th</sup> June 2018. The following vegetation associations were recorded within the permit application area during the detailed flora and vegetation survey in June 2018 (360 Environmental, 2018c):

- *Corymbia hamersleyana* low woodland over *Acacia pyrifolia*, *Acacia ancistrocarpa*, tall sparse shrubland over *Bonamia erecta*, *Corchorus parviflorus*, *Tephrosia* sp. Bungaroo Creek mid isolation clumps of shrubs over *Triodia epactia*, *Triodia schinzii* low closed tussock grassland; and
- *Corymbia zygophylla*, *Corymbia hamersleyana* low isolated trees over *Acacia pyrifolia*, *Grevillea wickhamii* subsp. *macrodonga*, *Hakea lorea* subsp. *lorea* tall sparse shrubland over *Ptilotus calostachyus*, *Pluchea ferdinandi-muelleri* mid isolated shrubs over *Acacia ancistrocarpa*, *Acacia stellaticeps*, *Acacia sphaerostachya* low open isolated clumps of shrubs over *Triodia epactia*, *Triodia schinzii* low tussock grassland.

**Clearing Description** Wodgina Lithium Project.  
Wodgina Lithium Pty Ltd proposes to clear up to 122.9 hectares of native vegetation within a boundary of approximately 762 hectares for the purpose of an aerodrome and supporting infrastructure. The project is located approximately 70 kilometres south east of Port Hedland, within the Town of Port Hedland.

**Vegetation Condition** Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994);  
to  
Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994).

**Comment** The vegetation condition was derived from a vegetation survey conducted by 360 Environmental (2018c). The proposed clearing is for an aerodrome, associated infrastructure (waiting area, car park, refuelling station), and transport corridor to support the Wodgina Lithium Project.

360 Environmental (2018d) conducted a reconnaissance flora and vegetation survey from 12<sup>th</sup> – 17<sup>th</sup> December 2017. This is outside of the recommended flora and vegetation survey period for the Eremaean Province that is 6 to 8 weeks post wet season during March to June (Environmental Protection Authority, 2016). To support the initial survey efforts, a detailed flora and vegetation survey was undertaken over the same survey area from 9<sup>th</sup> – 16<sup>th</sup> June 2018 (360 Environmental, 2018a).

### 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 clearing permit application area is located within the Chichester subregion of the Interim Biogeographic Regionalisation for Australia (IBRA) Pilbara Bioregion (GIS Database). The Chichester subregion supports a shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands, while *Eucalyptus leucophloia* tree steppes occur on the basaltic ranges (CALM 2002).

The reconnaissance flora survey identified 62 flora taxa from 36 genera and 20 families within the survey area (360 Environmental, 2018a). 360 Environmental (2018c) conducted a comparative study of their survey results to other flora and vegetation surveys undertaken within a 13 kilometre radius from the permit application area during the recommended time (May, June and September). 360 Environmental (2018c) found that the level of species diversity found in the flora and vegetation surveys by Woodman (2012) and Western Botanical (2017) did not return significantly higher species diversity results. The vegetation present within the permit application area was considered to range from 'Very Good' to 'Good', with majority (61.9%) of the vegetation in a very good condition (360 Environmental, 2018a; 360 Environmental, 2018c; 360 Environmental, 2018d).

There are no Threatened Ecological Communities (TECs) within the subregion, and no Threatened Flora was recorded within 20 kilometres of the permit application area (360 Environmental, 2018a; 360 Environmental, 2018d; CALM 2002; GIS Database). There are also no Priority Ecological Communities (PECs) within the application area, and no Priority flora species has previously been recorded within the application area (360 Environmental, 2018a; 360 Environmental, 2018d; GIS Database).

The desktop assessment identified 44 conservation significant flora taxa potentially occurring within the survey area, with none of these species identified as occurring within the permit application area. One Priority Flora species was recorded within the application area (360 Environmental, 2018a; 360 Environmental, 2018d);

- *Heliotropium muticum* (Priority 3) (1 plant recorded).

*Heliotropium muticum* is known from multiple records throughout the region (Western Australian Herbarium, 2018). The detailed flora and vegetation survey (June 2018) targeted this species and no other plants were recorded. The proposed clearing of one plant is unlikely to impact the conservation significance of this species.

Four introduced weeds were identified during the survey of the Wodgina Lithium mine site, which includes the proposed gas pipeline and aerodrome. One of these, *Calotropis procera*, is listed as Declared Pest or Weeds of National Significance under the *Biosecurity and Agriculture Management Act 2007*. The other three weed species recorded are Kapok (*Aerva javanica*), Buffel Grass (*Cenchrus ciliaris*), and *Passiflora foetida* var. *hispida*. None of these weed species are found within the permit application area (360 Environmental, 2018a; 360 Environmental, 2018c; 360 Environmental, 2018d). However, it should be noted that if the same machinery is to be used for clearing between the different areas of the Wodgina Lithium mine site, care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species into non-infested areas. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

One fauna habitat type was recorded within the application area, which is considered to be extensive in range and not restricted to any particular area (360 Environmental, 2018c). A Level 1 fauna survey was conducted 30<sup>th</sup> January – 6<sup>th</sup> February 2018 and a targeted fauna survey was undertaken from 9<sup>th</sup> – 16<sup>th</sup> June 2018. 57 terrestrial vertebrate fauna species were recorded during the Level 1 survey (360 Environmental, 2018d). Of these 57 species, four species of conservation significance was recorded within the application area during the targeted fauna survey that included the Western Pebble-mound mouse (*Pseudomys chapmani*), Bilby (*Macrotis lagotis*), Brush-tailed Mulgara (*Dasyercus blythi*), and Pilbara Leaf-nosed Bat (*Rhinioncteris aurantia*) (360 Environmental, 2018b; 360 Environmental, 2018d).

The results of the flora, vegetation and fauna survey indicate that the permit application area does not contain a high level of biodiversity (360 Environmental, 2018c). Further, the flora taxa recorded within the application area are typical for the representative areas (360 Environmental, 2018a). Therefore, it is expected that the clearing of 122.9 hectares within a boundary of 762 hectares is unlikely to have a significant impact on the biodiversity in a regional and local context.

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

##### Methodology

360 Environmental (2018a)  
360 Environmental (2018b)  
360 Environmental (2018c)  
360 Environmental (2018d)  
CALM (2002)  
Environmental Protection Authority (2016)  
Western Australian Herbarium (2018)  
Western Botanical (2017)

GIS Database:

- IBRA Australia
- Pre-European Vegetation
- Threatened and Priority Flora
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers
- Threatened Fauna

**(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**

One fauna habitat was recorded within the permit application area and is broadly described as 'Grassland – flat plain on Sand with low Eucalyptus Woodland'. This fauna habitat is characterised by an understorey of *Triodia* spp. grassland over a flat landscape of red sand, and the upper stratum consist of a midstorey of *Acacia*, *Grevillea* and *Hakea* spp. under an overstorey of *Corymbia hamersleyana* and *C. zygomphyla* (360 Environmental, 2018c; 360 Environmental, 2018d).

A desktop study identified the following conservation significant species as having either previously been recorded within, or having a 'High' likelihood of occurrence within the application area;

- Bilby (*Macrotis lagotis*) – Vulnerable;
- Brush-tailed Mulgara (*Dasyercus blythi*) – Priority 4;
- Ghost Bat (*Macroderma gigas*) – Vulnerable;
- Pilbara Lead-nosed Bat (*Rhinioncteris aurantia*) – Vulnerable; and
- Western pebble-mound Mouse (*Pseudomys chapmani*) - Priority 4.

A 'High' likelihood classification indicates that a preferred habitat is present in the application area and known species distribution has been recorded on more than one occasion within 15 kilometres of the application area in the last 15 years (360 Environmental 2018b).

A Level 1 fauna survey was undertaken from 30<sup>th</sup> January – 6<sup>th</sup> February 2018 (360 Environmental, 2018d). The habitat type was further divided and described into four features 1) quartz outcrop; 2) grassland foot slopes; 3) grassland sands; and 4) low-lying habitat (360 Environmental 2018b, 360 Environmental 2018d).

This fauna survey recorded a mound of the Western Pebble-mound Mouse within the application area from the grassland foot slopes habitat feature. There were no other records and/or captures of other conservation significant species that has a medium or high likelihood of being within the permit application area.

A targeted Northern Quoll (*Dasyurus hallucatus*) survey was conducted as part of this fauna survey. Habitat suitable for Northern Quolls was not found within the permit application area, but they may utilise the grasslands foot slopes for dispersal (360 Environmental, 2018d). It is noted that the area experienced high temperatures and dry conditions. Consequently, the timing of the survey was considered to be a limitation that has potentially contributed to a lower number of fauna specimens being recorded during the survey (360 Environmental, 2018c; 360 Environmental, 2018d).

To supplement the initial survey efforts, a targeted fauna survey was conducted over the application area from 9<sup>th</sup> – 16<sup>th</sup> June 2018. No significant limitations were identified for the targeted fauna survey (360 Environmental, 2018b). The targeted species in this survey were the species listed above that have either previously been recorded within, or having a 'High' likelihood of occurrence within the application area.

The results of the targeted fauna survey found;

- Two aged scats that may potentially belong to Bilbies.
- One aged burrow, two aged scats and one recent track that may potentially be of the Brush-tailed Mulgara.
- Evidence of the Pilbara Leaf-nosed Bat in the form of one call recorded on the 15<sup>th</sup> June 2018.
- There was no evidence of the Ghost Bat or other conservation significant fauna within the application area during the targeted fauna survey.

Two aged Bilby scats of 'medium' certainty was found during the targeted fauna survey. As no other evidence was found, this suggests that the density of any Bilby population that may occur within the application is low. Similarly, the evidence of the Brush-tailed Mulgara occurring within the application area was one aged burrow and two aged scats of 'low to medium' certainty. The recent track found was also considered to be 'low to medium' certainty, as there are other similar species present in the region, such as the Little Red Kalutas (*Dasykaluta rosamondae*), that the tracks could belong to (360 Environmental, 2018b). The majority of the application area is within the grassland sands habitat feature. Typically, sandy substrates are considered suitable for conservation significant species such as the Brush-tailed Mulgara and Bilby, as it provides refuge and burrowing opportunities. However, the sand substrate within the application area was identified to have a higher clay content than the surrounding range. This harder substrate may increase the difficulty associated with digging for burrowing and foraging, potentially reducing the habitat suitability (360 Environmental, 2018b).

The Pilbara Leaf-nosed Bat is also likely to use the grassland sand habitat feature for foraging. However given that there was only one call recorded, it is likely that the number of individuals utilising this area for foraging is low (360 Environmental, 2018b). The application area does not have any caves that are utilised by the Pilbara Leaf-nosed Bats, therefore the application area is not considered to be significant habitat (360 Environmental, 2018b; 360 Environmental 2018d).

The grassland foot slopes habitat feature is considered to be suitable for the Western pebble-mound Mouse, but it is not considered to be their core habitat (360 Environmental, 2018d). Similarly, the isolated quartz outcrop habitat feature provides appropriate habitat for the Western pebble-mound Mouse, as it contains similar vegetation to the surrounding fauna habitat with slightly higher shrub densities on substrate comprised of quartz rocks and pebbles instead of sand/clay (360 Environmental, 2018b). However, given that there was no record of the Western Pebble-mound mouse during the targeted fauna survey, and only one record identified in the initial Level 1 fauna survey, the species is not considered to be dependent on any of the fauna habitats within the application area (360 Environmental, 2018b).

The low-lying habitat feature is likely to provide sporadic opportunities for species after significant rainfall events; particularly for frog species that utilise this feature for breeding after rainfall (360 Environmental, 2018b).

In addition to the targeted fauna survey, a Short Range Endemic (SRE) reconnaissance survey was conducted over the application area. 23 invertebrates from three classes and five orders were recorded. One specimen (Chilopoda, Scutigleridomorpha, Sctigeridae invertebrate class) was identified to potentially contain an SRE taxa but this is currently pending further identification prior to assignation of any SRE status (360 Environmental, 2018b).

The fauna habitat identified within the application area is well represented in the surrounding landscape, and extends beyond the aerodrome envelope (360 Environmental, 2018c). The habitat type and/or features are not unique to the local region and unlikely to be specific importance to any conservation significant species identified to occur within the application area. Clearing 122.9 hectares of this habitat within a boundary of 762 hectares is unlikely to have a significant impact on fauna habitat availability at a regional level.

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

**Methodology** 360 Environmental (2018c)  
360 Environmental (2018b)  
360 Environmental (2018d)  
GIS Database:  
- Imagery  
- Threatened Fauna

**(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 permit application area did not record any species of Threatened flora (360 Environmental, 2018a; 360 Environmental, 2018d)

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

**Methodology** 360 Environmental (2018a)  
360 Environmental (2018d)  
GIS Database:  
- 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 permit application area (GIS Database). A flora and vegetation survey of the permit application area did not identify any TECs (360 Environmental, 2018a; 360 Environmental, 2018c; 360 Environmental, 2018d).

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

**Methodology** 360 Environmental (2018a)  
360 Environmental (2018c)  
360 Environmental (2018d)  
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 99.6% of the pre-European vegetation still exists in the IBRA Pilbara Bioregion (Government of Western Australia, 2018).

The application area is broadly mapped as Beard vegetation associations 93: Hummock grasslands, shrub steppe; kanji over soft spinifex (GIS Database). Approximately 99.9% 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	17,808,657.05	17,733,583.88	99.58	Least Concern	10.12
Beard vegetation associations – WA					
93	3,044,309.52	3,040,640.98	99.88	Least Concern	1.96
Beard vegetation associations – Pilbara Bioregion					
93	3,042,114.27	3,038,471.67	99.88	Least Concern	1.96

\* 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 not at variance to this Principle**

There are no watercourses or wetlands within the area proposed to clear (360 Environmental, 2018c; 360 Environmental, 2018d; GIS Database). The vegetation survey did not identify any vegetation as being associated with a watercourse or wetland (360 Environmental, 2018a; 360 Environmental, 2018d).

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

**Methodology** 360 Environmental (2018a)  
360 Environmental (2018c)  
360 Environmental (2018d)  
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 permit application area lies within the Uaroo 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 Uaroo land system is described as broad sandy plains supporting shrubby hard and soft spinifex grasslands. It is noted that some erosion is evident on drainage tracts (Land Unit 6) of this land system (Van Vreeswyk et al. 2004). However, there are no drainage tracts within the clearing permit application area. The remaining land units of the Uaroo land system is not generally susceptible to erosion (Van Vreeswyk et al. 2004). Therefore, the proposed clearing of up to 122.9 hectares of native vegetation within a boundary of approximately 762 hectares, for the purpose of an aerodrome, transportation and infrastructure corridors is unlikely to cause appreciable land degradation.

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

**Methodology** Van Vreeswyk et al. (2004)  
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 Mungaroo Range Nature Reserve which is located approximately 63 kilometres southwest of the permit application area (360 Environmental, 2018c; 360 Environmental, 2018d; 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** 360 Environmental (2018c)  
360 Environmental (2018d)  
GIS Database:  
- DPaW Managed Lands and Waters

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

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

There are no Public Drinking Water Source Areas within or in close proximity to the permit application area (GIS Database). There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database). Surface water within the permit application area is likely to occur as sheet flow following heavy rains. With an annual evaporation rate over ten times the average annual rainfall, any surface water is likely to evaporate quickly (BOM, 2018).

The groundwater within the permit application area is between 500 – 1,000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database). This is considered to be fresh water. It would not be expected that the proposed clearing would cause salinity levels within the application or surrounding area to alter. The proposed clearing is unlikely to cause deterioration in the quality of underground water.

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

**Methodology** BOM (2018)  
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**

Rainfall in this region is generally low and highly variable, typically resulting from cyclone events and localised thunderstorms (Van Vreeswyk et al., 2004). The average annual rainfall is 319.2 millimetres with an annual evaporation rate of ~3400 millimetres (BOM, 2018). Whilst temporary localised flooding may occur briefly following heavy rainfall events, 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)  
Van Vreeswyk et al. (2004)  
GIS Database:  
- Hydrographic Catchments - Catchments  
- Hydrography, linear

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

##### **Comments**

The clearing permit application was advertised on 14 May 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 (WC1999/003) 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 permit 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**

- 360 Environmental (2018a) Wodgina Aerodrome - Detailed Flora and Vegetation Survey. Report for Mineral Resources Limited prepared by 360 Environmental Pty Ltd, 6 July 2018.
- 360 Environmental (2018b) Wodgina Aerodrome - Targeted Fauna Survey. Report for Mineral Resources Limited, prepared by 360 Environmental Pty Ltd, 5 July 2018.
- 360 Environmental (2018c) Wodgina Lithium Project - Airstrip Application for Native Vegetation Clearing Permit – Purpose Permit. Report for Mineral Resources Limited, prepared by 360 Environmental Pty Ltd, 11 April 2018.
- 360 Environmental (2018d) Wodgina Mine Site and Proposed Airstrip Flora, Vegetation and Fauna Assessment. Report for Mineral Resources Limited, prepared by 360 Environmental Pty Ltd, 19 February 2018.
- BOM (2018) Bureau of Meteorology Website - Climate Statistics for Australian locations, Summary statistics Port Hedland Airport. [http://www.bom.gov.au/climate/averages/tables/cw\\_004032.shtml](http://www.bom.gov.au/climate/averages/tables/cw_004032.shtml) (Accessed 22 May 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 22 May 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.
- Environmental Protection Authority (2016) Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment. Environmental Protection Authority, Western Australia.
- 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.
- Van Vreeswyk, A.M.E., Payne, A.L., Hennig, P., and Leighton, K.A. (2004) An Inventory and Condition Survey of the Pilbara Region, Western Australia. Department of Agriculture, Western Australia.
- Western Australian Herbarium (2018) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. <https://florabase.dpaw.wa.gov.au/> (Accessed 23 May 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}:-**

<b>T</b>	<p><b>Threatened species:</b> 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 Rare Flora).</p> <p><b>Threatened fauna</b> is that subset of ‘Specially Protected Fauna’ declared to be ‘likely to become extinct’ pursuant to section 14(4) of the <i>Wildlife Conservation Act 1950</i>.</p> <p><b>Threatened flora</b> 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 <i>Wildlife Conservation Act 1950</i>.</p> <p>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.</p>
<b>CR</b>	<p><b>Critically endangered species</b> Threatened species considered to be facing an extremely high risk of extinction in the wild. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i>, in Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.</p>
<b>EN</b>	<p><b>Endangered species</b> Threatened species considered to be facing a very high risk of extinction in the wild. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i>, in Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.</p>
<b>VU</b>	<p><b>Vulnerable species</b> Threatened species considered to be facing a high risk of extinction in the wild. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i>, in Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.</p>
<b>EX</b>	<p><b>Presumed extinct species</b> 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 <i>Wildlife Conservation Act 1950</i>, 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.</p>



- 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.