



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 9295/1

Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Calidus Resources Limited

1.3. Property details

Property: Miscellaneous Licences 45/584, 45/585, 45/586, 45/587, 45/588

Local Government Area: Shire of East Pilbara

Colloquial name: Moolyella Pipeline and Road

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
51.67		Mechanical Removal	Pipeline and Associated Infrastructure

1.5. Decision on application

Decision on Permit Application: Grant

Decision Date: 22 July 2021

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:
82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*; and
93: Hummock grasslands, shrub steppe; kanji over soft spinifex (GIS Database).

A flora and vegetation survey was conducted over the application area by Rapallo Environmental (Rapallo) during 25 September to 2 October 2020. The following vegetation associations were recorded within the application area (Rapallo, 2021):

A – *Acacia inaequilatera* over *Triodia epactia* and *Triodia wiseana* on stony plain

Low woodland to medium shrubland of *Acacia inaequilatera* with *Grevillea pyramidalis*, *Grevillea wickhamii*, and *Acacia bivenosa*; over mixed shrubs including *Corchorus parviflorus*; over *Triodia epactia* and/or *Triodia wiseana* hummock grassland occasionally dominated by *Triodia longiceps*. Occasional emergent *Corymbia hamersleyana* isolated low trees.

B – *Acacia stellaticeps* over *Triodia epactia* and *Triodia longiceps* on sand plain

Low mixed shrubland dominated by *Acacia stellaticeps*, over *Triodia epactia* and/or *Triodia longiceps* hummock grassland, sometimes with emergent *Acacia* species, *Grevillea* species and *Hakea lorea* tall shrubs to low trees.

C – *Eucalyptus camaldulensis* and *Melaleuca argentea* over *Acacia trachycarpa* and *Triodia longiceps* on major drainage

Eucalyptus camaldulensis and *Melaleuca argentea* open woodland with occasional *Eucalyptus victrix* or *Melaleuca glomerata*; over mixed tall to medium shrubland dominated by *Acacia trachycarpa* and **Calotropis procera*; over mixed medium to low shrubs; over *Triodia longiceps* sparse hummock grassland; over *Cyperus vaginatus* sedges and **Cenchrus ciliaris* and/or **Chloris barbata* grasses.

D – *Corymbia hamersleyana* over *Acacia eriopoda* and *Triodia wiseana* on rocky medium drainage

Mixed open woodland dominated by *Corymbia hamersleyana*, with *Eucalyptus victrix*, *Eucalyptus camaldulensis*, *Corymbia ferritcola* and *Atalaya hemiglauca*; over mixed open to sparse medium shrubland dominated by *Acacia eriopoda* with *Petalostylis labicheoides*, *Acacia pyrifolia*, *Cymbopogon ambiguus* and *Grevillea pyramidalis*; over *Triodia wiseana* sparse hummock grassland.

E – *Acacia trachycarpa* over *Triodia longiceps* and *Cyperus vaginatus* on sandy medium drainage

Tall to medium mixed sparse shrubland dominated by *Acacia trachycarpa*; over mixed low shrubs; over *Triodia longiceps* open to sparse hummock grassland; over *Cyperus vaginatus* sparse to isolated sedges and **Cenchrus ciliaris* grasses.

F – Mixed *Acacia* shrubland over *Triodia* species on minor drainage

Mixed tall to medium open *Acacia* shrubland with dominance varying from *Acacia eriopoda*, *Acacia inaequilatera*, or *Acacia stellaticeps*; with occasional emergent *Corymbia hamersleyana* or *Atalaya hemiglauca* trees; over mixed low shrubs; over *Triodia longiceps*, *Triodia wiseana*, and occasional *Triodia epactia* hummock grassland. Dominance of *Acacia* species appeared to be driven by the dominant species in the surrounding vegetation that the minor drainage lines intersected.

G – *Acacia eriopoda* over *Triodia* species surrounding granite outcrops

Acacia eriopoda sparse low woodland over sparse to isolated mixed shrubs dominated by *Grevillea wickhamii* over open to sparse hummock grassland dominated by *Triodia epactia*, *Triodia wiseana*, and/or *Triodia longiceps*, surrounding granite outcrops.

H – *Indigofera monophylla* and other mixed shrubs over *Triodia wiseana* on hill crests and slopes

Sparse mixed medium to low shrubland with *Indigofera monophylla*, *Grevillea pyramidalis*, *Corchorus parviflorus*, *Senna glutinosa* and *Hakea lorea*; over *Triodia wiseana* hummock grassland

I – *Senna glutinosa* and *Acacia orthocarpa* over *Triodia epactia* on low stony hills

Mixed open tall to medium shrubland dominated by *Senna glutinosa* and *Acacia orthocarpa*, with *Acacia inaequilatera* and *Grevillea wickhamii*; over mixed low shrubs; over *Triodia epactia* and occasional *Triodia wiseana* hummock grassland.

* denotes weed species

Clearing Description

Moolyella Pipeline and Road.

Calidus Resources Limited proposes to clear up to 51.67 hectares of native vegetation within a boundary of approximately 414 hectares, for the purpose of a pipeline and associated infrastructure. The project is located approximately 150 kilometres southeast of Port Hedland, within the Shire of East Pilbara.

Vegetation Condition

Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (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 Rapallo (2021).

The proposed clearing is for a 40 kilometre long borefield pipeline and an associated road required to facilitate the development of the Warrawoona Gold Project (Calidus, 2021). The proposed road will be approximately 10 metres wide and will be used for construction of the pipeline and for pipeline inspections (Calidus, 2021). To minimise clearing, existing exploration and pastoral tracks will be used where possible.

3. Assessment of application against Clearing Principles

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

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 is characterised by undulating Archaean granite, basalt plains and basaltic ranges. Plains support shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands, while ranges support *Eucalyptus leucophloia* (CALM, 2002).

A reconnaissance flora and vegetation survey was conducted over the application area by Rapallo (2021) between 25 September and 2 October 2020. The vegetation of the application area is dominated by *Acacia* shrubland and *Triodia* hummock grassland, interspersed by larger *Eucalyptus*, *Maleluca* and *Corymbia* species (Rapallo, 2021). No Threatened or Priority Ecological Communities were identified as potentially occurring within the application area and none of the vegetation types mapped and described are listed as Threatened or Priority Ecological Communities (Calidus, 2021; Rapallo, 2021).

A total of 115 flora species from 66 genera and 28 families were recorded within the application area, including six introduced species (Rapallo, 2021). A desktop assessment identified 46 flora species of conservation significance recorded within 100 kilometres of the application area (Rapallo, 2021). Of these 46 species, eight were considered likely or highly likely to occur within the application area due to the presence of suitable habitat and proximity of records (Rapallo, 2021). Priority flora species *Eragrostis crateriformis* (P3) was recorded from a single location in the northern part of the application area, within vegetation type A (Calidus, 2021; Rapallo, 2021). It is considered highly likely to occur elsewhere in the survey area, especially on stony plains and around creek lines (Calidus, 2021; Rapallo, 2021). This Priority flora species has been recorded outside the application area, to the south within the Warrawoona Gold Project area and other projects within the surrounds (Calidus, 2021; Rapallo, 2021). *Eragrostis crateriformis* is not locally or regionally restricted, and occurs across multiple IBRA regions (Western Australian Herbarium, 1998-). The proposed clearing is unlikely to have a significant impact on the conservation status of this species.

A desktop assessment identified a total of 329 vertebrate fauna species which have previously been recorded within the application area and surrounds (Rapallo, 2021). This includes 47 mammals (37 native and 10 non-native), 162 birds, 106 reptiles and ten amphibians (Rapallo, 2021). Of the 329 fauna species, 32 are of conservation significance, including nine mammal, 19 bird and four reptile species (Rapallo, 2021). Ten of the 32 conservation significant fauna species were considered possibly occurring within the application due to suitable habitat present (Rapallo, 2021). Five species are considered likely to occur, and five considered highly likely to occur, however none were considered to be reliant upon the application area for core breeding/roosting

habitat (Rapallo, 2021).

A total of 92 vertebrate species, comprising of 12 mammals, 63 birds, 16 reptiles and one amphibian were recorded during the field assessment of the application (Calidus, 2021; Rapallo, 2021). Two conservation significant fauna species were recorded within the application area: Pilbara leaf-nose bat (VU) and common sandpiper (MI) (Rapallo, 2021). None of the fauna habitats within the application area are primary breeding or roosting habitat for Pilbara leaf-nosed bat (Rapallo, 2021). The common sandpiper can move large distances in response to availability of water bodies and would not be restricted or reliant upon the application area for habitat (Rapallo, 2021). It is unlikely that the proposed clearing will significantly impact habitat availability for these species.

The vegetation associations, fauna habitats and landform types present within the application area, are well represented in surrounding areas (Calidus, 2021; Rapallo, 2021; GIS Database). The application area is unlikely to represent an area of higher biodiversity than surrounding areas, in either a local or regional context.

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

Methodology CALM (2002)
Calidus (2021)
Rapallo (2021)
Western Australian Herbarium (1998-)

GIS Database:

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

Comments Proposal may be at variance to this Principle

The following nine fauna habitats have been recorded within the application area (Rapallo, 2021):

- Low stony hills
- Stony plain
- Sand plain
- Major drainage
- Medium drainage – rocky
- Medium drainage – sandy
- Minor drainage
- Hillcrest/hillslope
- Granite outcrop

The majority of the application area consists of stony plain habitat (approximately 78%) (Calidus, 2021; Rapallo, 2021). Major drainage and sand plain habitats are deemed to be of high significance as they potentially provide suitable foraging, breeding, and dispersal habitat for multiple species of conservation significance (Rapallo, 2021). The remaining habitats are considered to be of moderate significance, due to providing foraging/dispersal habitat or are known to support priority or migratory species (Rapallo, 2021). None of the fauna habitats present are restricted to the application area, all fauna habitats are well represented in the surrounds and are common and widespread throughout the region (Rapallo, 2021).

The major drainage habitat provides a number of microhabitats and a stable source of food and water for various fauna species (Rapallo, 2021). Two conservation significant fauna species were identified within the major drainage habitat during the fauna assessment: Pilbara leaf-nosed bat (*Rhinionictes aurantia*, VU) and common sandpiper (*Actitis hypoleucos*, MI) (Rapallo, 2021). Potential impacts to larger vegetation within drainage habitats may be minimised by a restricted clearing condition, which will be of benefit to available fauna habitat and various fauna species.

Local populations of Pilbara leaf-nosed bat can be found south of the application area, within the Warrawoona Gold Project area (Rapallo, 2021). The Pilbara leaf-nosed bat was identified within major drainage habitat through calls (Rapallo, 2021). This species will potentially forage over most habitats within the application area, with major drainage containing the most significant foraging habitat (Rapallo, 2021). The proposed clearing will not impact any roosting/breeding habitat for local populations of Pilbara leaf-nosed bat (Rapallo, 2021). Approximately 2% (8.4 hectares) of the application area consists of major drainage habitat (Rapallo, 2021). It is not anticipated that local populations of Pilbara leaf-nosed bat or any other fauna species will be impacted by the clearing of a narrow corridor within this habitat type (Rapallo, 2021).

Sand plain habitat comprises approximately 10% (41.6) hectares of the application area (Rapallo, 2021). The

sand plain habitat was determined to have high significance due to the potential for greater bilby (*Macrotis lagotis*, VU) and brush-tailed mulgara (*Dasyercus blythi*, P4) breeding, foraging and dispersal habitat (Rapallo, 2021). Neither species were identified during the fauna assessment, however were rated as highly likely to occur within the application area (Rapallo, 2021). Potential impacts to greater bilby and brush-tailed mulgara as a result of the proposed clearing may be minimised by the implementation of a fauna management condition that requires pre-clearance surveys to determine the presence of these two fauna species within the application area (Calidus, 2021; Rapallo, 2021).

which will prevent the clearing of large trees within drainage lines.

a result of the proposed clearing may be minimised by the implementation of a fauna management condition which requires the relocation of any individuals found within the path of the clearing.

Given the narrow, linear nature of the proposal, the proposed clearing is unlikely to significantly reduce the extent or availability of any fauna habitats identified within the application area. All habitats are represented outside the application area, regionally, and within conservation estates (Rapallo, 2021).

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

Methodology Calidus (2021)
Rapallo (2021)

GIS Database:
- Imagery
- Pre-European Vegetation
- Threatened Fauna

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened 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 (Calidus, 2021; Rapallo, 2021).

None of the vegetation types recorded within the application area are known habitat for any species of Threatened flora, and the vegetation proposed to be cleared is unlikely to be necessary for the continued existence of any species of Threatened flora (Rapallo, 2021).

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

Methodology Calidus (2021)
Rapallo (2021)

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 (Calidus, 2021; Rapallo, 2021).

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

Methodology Calidus (2021)
Rapallo (2021)

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 IBRA Pilbara Bioregion (Government of Western Australia, 2019). The application area is broadly mapped as Beard vegetation associations 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*; and 93: Hummock grasslands, shrub steppe; kanji over soft spinifex (GIS Database). Approximately 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, 2019).

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	17,731,764	~99	Least Concern	10.12
Beard vegetation associations – WA					
82	2,565,901	2,553,206	~99	Least Concern	11.51
93	3,044,309	3,040,640	~99	Least Concern	1.96
Beard vegetation associations – Pilbara Bioregion					
82	2,563,583	2,550,888	~99	Least Concern	11.52
93	3,042,114	3,038,471	~99	Least Concern	1.96

* Government of Western Australia (2019)

** 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 (2019)

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 (Calidus, 2021; Rapallo, 2021; GIS Database). Multiple ephemeral drainage lines intersect the application area (GIS Database). These drainage lines are dry for most of the year, and flow following significant rainfall (Calidus, 2021; Rapallo, 2021).

The vegetation assessment of the application area identified six groundwater dependent species (Rapallo, 2021). *Eucalyptus camaldulensis* and *Melaleuca argentea* were recorded within vegetation type C, while *Acacia ampliceps* (and a potential hybrid *Acacia ampliceps* x *sclerosperma*), *Atalaya hemiglauca*, *Eucalyptus victrix*, and *Melaleuca glomerata* were recorded within vegetation types C, D and E (Calidus, 2021; Rapallo, 2021).

Based on the above, the proposed clearing is at variance to this Principle. Potential impacts to vegetation growing in association with watercourses may be minimised by the implementation of a restricted clearing condition which will prevent the clearing of large trees within drainage lines.

Methodology Calidus (2021)
Rapallo (2021)

GIS Database:
- Hydrography, linear

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

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

The application area lies within the Macroy, River and Talga land systems (GIS Database). These land systems have been mapped and described in technical bulletins produced by the former Department of Agriculture (now the Department of Primary Industries and Regional Development).

The Macroy land system is described as stony plains and occasional tor fields based on granite supporting hard and soft spinifex grasslands (Van Vreeswyk et al., 2004). Soils within this system are not likely to erode (Van Vreeswyk et al., 2004).

The River land system consists of active flood plains and major rivers supporting grassy eucalypt woodlands, tussock grasslands and soft spinifex grasslands (Van Vreeswyk et al., 2004). Susceptibility to erosion is high or very high if vegetative cover is removed (Van Vreeswyk et al., 2004).

The Talga land system consists of hills and ridges of greenstone and chert and stony plains supporting hard and soft spinifex grasslands (Van Vreeswyk et al., 2004). This land system is not susceptible to erosion (Van Vreeswyk et al., 2004).

The application area is generally not susceptible to erosion. A very small portion of the application area is comprised of the River land system (approximately 4 hectares). The proposed clearing 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 former Meentheena Pastoral Lease which is located approximately 23 kilometres east 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). The closest PDWSA is the Marble Bar Water Reserve, approximately 13 kilometres west of the application area (GIS Database). There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database). Drainage lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall (Calidus, 2021). The proposed clearing is unlikely to result in significant changes to surface water flows.

Groundwater recharge is likely through direct infiltration or through the base of the creek systems within the application area during runoff events (Calidus, 2021). Recharge will usually be a result of summer storms or cyclone events (Calidus, 2021). 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 Calidus (2021)

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 Pilbara bioregion is semi-arid, with a low average rainfall of approximately 403.1 millimetres per year (BoM, 2021). Drainage lines in the area are dry for most of the year, only flowing following significant rainfall in the summer months (January to March) (Calidus, 2021).

There are no permanent water courses or waterbodies within the application area (GIS Database). Drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events (Calidus, 2021). 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 (2021)
Calidus (2021)

GIS Database:
- Hydrography, linear

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

Comments

The clearing permit application was advertised on 31 May 2021 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 are two native title claims (WC1999/008, WC1999/008) over the area under application (DPLH, 2021). These claims have been registered with the National Native Title Tribunal or determined by the Federal Court on behalf of the claimant groups. 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 Site of Significance within the application area (DPLH, 2021). 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 (2021)

4. References

- BoM (2021) Bureau of Meteorology Website – Climate Data Online, Marble Bar. Bureau of Meteorology. <http://www.bom.gov.au/climate/data/> (Accessed 16 July 2021).
- Calidus (2021) Warroona Gold Project: Moolyella pipeline and road. NVCP Application, Supplementary Information Report. Prepared by Calidus Resources Limited, May 2021.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.
- DPLH (2021) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. <https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS> (Accessed 15 July 2021).
- 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 (2019) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth. <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.
- Rapallo (2021) Flora and Vertebrate Fauna Assessment of the Moolyella Pipeline. Prepared by Rapallo Environmental, for Calidus Resources Limited, May 2021.
- Van Vreeswyk, A.M.E., Payne, A.L., Leighton, K.A. and Hennig, P. (2004) An inventory and condition survey of the Pilbara Region, Western Australia. Technical Bulletin No. 92. Department of Agriculture, South Perth, Western Australia.
- Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. <https://florabase.dpaw.wa.gov.au/> (Accessed 20 July 2021).

5. Glossary

Acronyms:

BC Act	<i>Biodiversity Conservation Act 2016</i> , Western Australia
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)
DAWE	Department of Agriculture, Water and the Environment, Australian Government
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
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)
DoEE	Department of the Environment and Energy (now DAWE)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora (now known as Threatened Flora)
DWER	Department of Water and Environmental Regulation, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPA	Environmental Protection Authority, 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:

{DBCA (2019) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia):-

T

Threatened species:

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

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 in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN

Endangered species

Threatened species considered to be “*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU

Vulnerable species

Threatened species considered to be “*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct Species:

EX Extinct species

Species where “*there is no reasonable doubt that the last member of the species has died*”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that “*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species:

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes 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 fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P Priority species:

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species 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.