

1. Application details and outcomes

1.1. Permit application details

Permit number:	9735/1
Permit type:	Purpose Permit
Applicant name:	Iluka Resources Limited
Application received:	12 May 2022
Application area:	4.517 hectares
Purpose of clearing:	Mine Rehabilitation
Method of clearing:	Mechanical Removal
Tenure:	Mineral Sands (Eneabba) Agreement Act 1975 Mining Lease 267SA (AM 7000267)
Location (LGA area/s):	Shire of Carnamah
Colloquial name:	West Mine Void Rehabilitation

1.2. Description of clearing activities

Iluka Resources Limited proposes to clear up to 4.517 hectares of native vegetation within a boundary of 4.517 hectares, for the purpose of doing revegetation work on a previously rehabilitated mine void. The project is located approximately 6 kilometres southwest of Eneabba, within the Shire of Carnamah.

The application is to allow for the clearing of existing access tracks where widening for access of Surface Mobile Equipment may be required and for the clearing of native vegetation previously rehabilitated. Mining activities in the application area occurred from 1990 to 1999. Extensive earthworks, drainage controls and revegetation efforts were completed in 2003 to rehabilitate the void to a water body, with slopes rehabilitated with native vegetation. Since the native rehabilitation was completed in 2003 the regional groundwater levels have declined. This decline has exposed steep unvegetated slopes below the 2003 water line. Iluka intends to make the banks of the void safe and stable and retain it as a gently sloped open void revegetated with native vegetation.

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	14 July 2022
Decision area:	4.517 hectares of native vegetation

1.4. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Mines, Industry Regulation and Safety (DMIRS) on 12 May 2022. DMIRS advertised the application for a public comment for a period of 21 days, and one submission was received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix C), relevant datasets (Appendix G), supporting information provided by the applicant (Appendix A) including representative photos of the flora and vegetation of the application (Appendix F), the clearing principles set out in Schedule 5 of the EP Act (Appendix D), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3).

The assessment identified that the proposed clearing may result in:

- the potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing;

- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback; and
- retain vegetative material and topsoil, revegetate and rehabilitate.

2. Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment includes:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Mining Act 1978* (WA)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2014)
- *Procedure: Native vegetation clearing permits* (DWER, October 2021)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values. The applicant has measures in place to minimise the spread of dieback and weeds (Iluka, 2016). The applicant has also included the proposed clearing area as part of their rehabilitation efforts (Iluka 2022a, Iluka, 2022c).

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix C) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles identified that the impacts of the proposed clearing present a risk to biological values (adjacent flora and vegetation). The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (flora) - Clearing Principles (a)

Assessment

The application area has been previously cleared for mining purposes and was rehabilitated in 2003 by Iluka Resources Limited. A flora survey of the Eneabba West Mine Void performed by Iluka Resources Limited in 2022 revealed that although there are no conservation significant flora within the application area, there are records of conservation significant flora in the vicinity. Although the flora survey was not conducted by certified botanists, the personnel who conducted the survey have vast knowledge of flora and extensive experience conducting flora surveys in the bioregion of the application area.

GIS Database analysis showed that there are eight records of conservation significant flora in the surroundings of the application area as described in Appendix C:

- One record of *Calytrix superba* (Priority 4)
- One record of *Eremophila subangustifolia* (Threatened)
- Three records of *Grevillea biformis* subsp. *cymbiformis* (Priority 3)
- Three records of *Scaevola eneabba* (Priority 2)

One of the records of the Priority 3 flora was located on what is now bare ground as the groundwater levels have declined since the area was last rehabilitated in 2003 (Iluka, 2022c). The records listed above are not unique to the application area (Western Australian Herbarium 1998-) and their clearing would not represent a significant loss of biodiversity. Other records of the species listed above were mapped inside an ESA and a TEC buffer zone (GIS Database). Due to the disturbance that previously took place in the application area and the current artificial condition of the area proposed to be cleared, it is unlikely that the application area could represent a significant habitat for conservation significant flora of the region.

The application area falls within a dieback infested area. The risk of spreading dieback and weeds to areas not currently infested is present but can be managed with appropriate hygiene protocols.

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on vegetation adjacent to threatened and priority flora habitats are not likely to be significant. The potential impacts of the proposed clearing are the spread of weeds and dieback to adjacent vegetation.

Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 14 June 2022 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. One submission was received in relation to this application.

There is one native title claim (WC2019/008) over the area under application (DPLH, 2022). This claim has been determined by the Federal Court on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no registered Aboriginal Sites of Significance within the application area (DPLH, 2022). 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.

End

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
A vegetation assessment report prepared by Iluka Resources Limited on June 2022 was provided as part of a requested IBSA package.	This document was used in the assessment of principles a and d.

Appendix B. Details of public submissions

Summary of comments	Consideration of comment
“In regards to this application CPS 9735/1 Council does not have any objections to the proposal or any additional comments to make.”	This comment was taken into account during the assessment of the application.

Appendix C. Site characteristics**C.1. Site characteristics**

Characteristic	Details
Local context	The area proposed to be cleared is part of a 143.2 hectare isolated patch of native vegetation in the intensive land use zone of Western Australia. The application area is located approximately 5.5 kilometres southwest from the town of Eneabba. It is adjacent to Coolimba-Eneabba Rd (north of the application area). Across from this road, vegetation has been cleared. It is also adjacent to Erindoon Rd (west of the application area). There is an Environmentally Sensitive Area approximately 60 metres west of the application area (across from Erindoon Rd). There is sparse vegetation and cleared areas to the south and the east of the application area.
Ecological linkage	According to available databases, the application area does not contain any known or mapped ecological linkages.
Conservation areas	Lake Logue Nature Reserve is an Environmentally Sensitive Area and is located approximately 40 metres west of the application area (GIS Database).
Vegetation description	The vegetation of the application area is broadly mapped as the following Beard vegetation association: 378: Shrublands; scrub-heath with scattered <i>Banksia</i> spp., <i>Eucalyptus tottiana</i> & <i>Xylomelum angustifolium</i> on deep sandy flats in the Geraldton Sandplain Region (GIS Database).
Vegetation condition	Aerial imagery and photos provided by the proponent indicate the vegetation within the proposed clearing area is in Good to Degraded (Keighery, 1994) condition. The full Keighery (1994) condition rating scale is provided in Appendix E. Representative photos are available in Appendix F.
Climate and landform	The climate of the region is winter dormant characterised by wet winters and dry summers. The average annual rainfall of the area (Eneabba station) is of 489.6 millimetres (BoM 2022).
Soil description	The soil is mapped as unit Ca27 (GIS Database). This soil unit is described as sandy plains with occasional pockets of sand dunes, a few small swamps, and stream courses: chief soils are leached sands, often with a sandy clay substrate between 3 and 6 feet in depth (Northcote et al. 1960-68).
Land degradation risk	The application area has been mapped as the Eneabba Plain System (GIS Database). The Department of Primary Industries and Regional Development (DPIRD) (2022) describe this land system as level to gently undulating sandplain to the north-west and south-west of Eneabba. Pale deep sands, grey shallow to deep sandy duplexes, moderately deep sandy gravels and yellow deep sands common. <i>Banksia</i> woodlands and heathlands. Details of land degradation risks for the application area is available in section C.3
Waterbodies	The desktop assessment and aerial imagery indicated that one minor, non-perennial watercourse used to transect the area proposed to be cleared (GIS Database). This watercourse

Characteristic	Details
	was permanently redirected around a mining pit present in 1999 (Iluka Resources Limited, 2022c).
Hydrogeography	The application area is within the Arrowsmith Groundwater Area legislated by the <i>RIWI Act 1914</i> (GIS Database). The mapped groundwater salinity is 1,000-3,000 milligrams per litre total dissolved solids which is described as brackish to saline (GIS Database).
Flora	There are no known Threatened or Priority flora within the application area (GIS Database, Iluka, 2022c). There are Priority 3 and Priority 4 flora approximately 100 metres east and west of the application area. Priority 2 flora can be found inside Lake Logue Nature Reserve (LLNR). There was one record of a Threatened flora species approximately 4 kilometres west of the application area (inside LLNR).
Ecological communities	There are no Threatened Ecological Communities (TEC) or Priority Ecological Communities (PEC) mapped within the application area (GIS Database). The Ferricrete floristic community is a TEC listed as Vulnerable approximately 6 kilometres south of the application area.
Fauna	There are no records of Threatened or Priority fauna within the application area (GIS Database). There are eight records of four different species of conservation significance within 7 kilometres east and west of the application area.

C.2. Vegetation extent

	Pre-European area (ha)	Current extent (ha)	Extent Remaining %	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA Managed Lands
IBRA Bioregion - Geraldton Sandplains	3,136,037	1,404,424	~45	568,255	18.12
IBRA Subregion - Leseur Sandplain	1,171,775	502,977	~43	212,498	18.13
Local Government – Shire of Carnamah	287,231	118,659	~41	49,793	17.34
Beard vegetation associations - State					
Veg Assoc No. 378	95,109	61,032	~64	13,425	14.12
Beard vegetation associations - Bioregion					
Veg Assoc No. 378	95,109	61,032	~64	13,425	14.12
Beard vegetation associations - subregion					
Veg Assoc No. 378	4,187	364	~9	0	0

Government of Western Australia (2019)

C.3. Land degradation risk table

Risk categories	Land Unit 1
Wind erosion	L1: <3% of map unit has a high to extreme wind erosion risk
Water erosion	L1: <3% of the map unit has a very high to extreme water erosion risk
Salinity	L1: <3% of the map unit has a moderate salinity risk or is presently saline
Subsurface Acidification	L1: <3% of the map unit has a high subsurface acidification risk or is presently acid
Flood risk	L1: <3% of the map unit has a moderate to high flood risk
Water logging	L1: <3% of the map unit has a moderate to very high waterlogging risk
Phosphorus export risk	L1: <3% of the map unit has a high to extreme phosphorus export risk

(DPIRD, 2022)

Appendix D. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>There are no known PECs within or near the proposed clearing area (GIS Database).</p> <p>Only 26 native flora species were identified within the application area (Iluka, 2022b). The area proposed to be cleared does not contain any known Priority flora (GIS Database; Iluka, 2022c). There are records of Priority Flora in the surroundings of the proposed clearing area (GIS Database). Dieback is present within the application area (Iluka, 2022c) and there were some weeds recorded within the application area, however, none were Declared Pests or Weeds of National Significance (WONS). Weeds and dieback have the potential to significantly change the dynamics of a natural ecosystem and lower the biodiversity of an area. Potential impacts to the biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed and dieback management condition.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>Given the limited range of habitats, small areas and the poorer condition of the vegetation, in comparison to nearby large expanses of undisturbed and un-fragmented native vegetation, the area proposed to be cleared is unlikely to represent significant habitat for fauna (Iluka, 2022c).</p>	Not likely to be at variance	No
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u></p> <p>There are no known species of Threatened flora within the application area (GIS Database; Iluka, 2022c). The area proposed to be cleared is unlikely to contain habitat for the continued existence on any species of Threatened flora due to its artificial state.</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>There are no known TECs within the application area (GIS Database, Iluka, 2022c). However, there is a TEC buffer zone that extends up to 1 kilometre south of the proposed clearing area (GIS Database). This TEC is restricted to ferricrete soils which do not occur within the application area (Iluka 2022b). The potential impact from the proposed clearing to the nearby TEC is the spread of weeds and dieback. Weed control and hygiene conditions will minimise this impact. Given the conditions in place and the small scale of the application area, the proposed clearing is not likely to affect any surrounding TECs.</p>	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The application area falls within the Leseur Sandplains subregion of the Geraldton Sandplains Interim Biogeographic Regionalisation of Australia (IBRA) Bioregion (GIS Database). Approximately 45 per cent of the pre-European vegetation remains in the Geraldton Sandplains Bioregion (Government of Western Australia, 2019). Beard vegetation association 378 still has approximately 64 per cent of the pre-European extent of this vegetation association at the state and bioregional level (Government of Western Australia, 2019). At the subregion level, this vegetation association only has an extent of 9 per cent of pre-European vegetation remaining (Government of Western Australia, 2019). It is important to note that the application area is a rehabilitated mine void in a previously cleared and mined area. Therefore, the vegetation in the application area is unlikely to be significant as a remnant of native vegetation.</p>	Not likely to be at variance	No
<p><u>Principle (h):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>Lake Logue Nature Reserve is located approximately 40 metres west of the application area (GIS Database). The potential impact from the proposed clearing to the nearby ESA is the spread of weeds and dieback. Weed control and hygiene conditions will minimise this impact. Given the conditions in place and the small scale of the application area, the proposed clearing is not likely to have an impact on the environmental values of the adjacent conservation area.</p>	Not likely to be at variance	No
Environmental value: land and water resources		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>There are no natural water courses or wetlands recorded within the application area (GIS Database). There is an artificial wetland created by past mining activities within the application area. The proposed clearing is to be performed at a small scale and it is unlikely to impact surface water flow.</p>	Not likely to be at variance	No
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The land system within the application area has been mapped by the Department of Primary Industries and Regional Development (DPIRD). The application area has low risk of land degradation (see section C.3). The proposed clearing area will be rehabilitated afterwards, so any potential land degradation risks caused by the proposed clearing are unlikely to impact the quality of the land.</p>	Not likely to be at variance	No
<p><u>Principle (i):</u> <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.”</i></p> <p><u>Assessment:</u></p> <p>There are no Public Drinking Water Sources Areas, water courses, or natural wetlands within the application area. The application area contains an artificial wetland created by past mining activities. The closest Public Drinking Water Source Area is located approximately 6.2 kilometres east from the proposed clearing area (GIS Database). Given the small scale of the</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
proposed clearing, it is unlikely for surface or ground water quality to be impacted.		
<p><u>Principle (j)</u>: <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment</u>:</p> <p>The average annual evaporation rate (2,200 millimetres) of the area, greatly exceeds the average annual rainfall (489.6 millimetres) (BoM, 2022). There are no natural perennial watercourses or wetlands recorded within or nearby the application area. The application area contains an artificial wetland created by mining activities. Although high rainfall events may result in flooding, the proposed clearing is unlikely to cause, or exacerbate the incidence or intensity of flooding.</p>	Not likely to be at variance	No

Appendix E. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation’s ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from

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

Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as ‘parkland cleared’ with the flora comprising weed or crop species with isolated native trees or shrubs.

Appendix F. Photographs of the vegetation



Mine Void Area-Southern End Looking North



Proposed Clearing Area- Eastern Section



Proposed Clearing Area- Western Section



Mine Void Rework Area Northern End Looking East

Appendix G. Sources of information

G.1. GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- Aboriginal Heritage Places (DPLH-001)
- Clearing Regulations – Schedule One Areas (DWER-057)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Environmentally Sensitive Areas (DWER-046)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Pre-European Vegetation Statistics
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- Soil Landscape Mapping – Rangelands (DPIRD-064)
- WA Now Aerial Imagery

Restricted GIS Databases used:

- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

G.2. References

- BoM (2022) Bureau of Meteorology Website – Climate Data Online, Leinster Aero. Bureau of Meteorology. <http://www.bom.gov.au/climate/data/> (Accessed 20 May 2022).
- Department of Environment Regulation (DER) (2014) *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf
- Department of Planning, Lands and Heritage (DPLH) (2022) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. <https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS> (Accessed 20 May 2022).
- Department of Primary Industries and Regional Development (DPIRD) (2022) NRInfo Digital Mapping. Department of Primary Industries and Regional Development. Government of Western Australia. URL: <https://maps.agric.wa.gov.au/nrm-info/> (Accessed 20 May 2022).
- Environmental Protection Authority (EPA) (2016) Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment. Available from: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf
- 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. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
- Iluka (2016). Iluka *Phytophthora* Dieback Management Plan, Eneabba Operations, March 2016. Approved by the OEPA 12th September 2016.
- Iluka (2022a) Iluka Resources Limited application for clearing permit within State Agreement Lease M 267SA. Iluka Resources Limited, May 2022.
- Iluka (2022b) Native Vegetation Assessment Report West Mine Void Rehabilitation, Eneabba, Western Australia. June 2022
- Iluka (2022c) Native Vegetation Clearing Application - West Mine Void Rehabilitation, Eneabba, Western Australia. May 2022
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68) Atlas of Australian Soils, Sheets 1 to 10, with explanatory data. CSIRO and Melbourne University Press: Melbourne.
- Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed 25 May 2022).

4. 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.

Principles for clearing native vegetation:

- (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.
- (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.
- (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened 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.
- (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.
- (f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
- (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
- (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.
- (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.
- (j) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.