



# Clearing Permit Decision Report

## 1. Application details and outcomes

### 1.1. Permit application details

Permit number:	6794/3
Permit type:	Purpose Permit
Applicant name:	Barradale Sands Pty Ltd.
Application received:	18 July 2023
Application area:	48.025 hectares
Purpose of clearing:	Sand mining and associated activities
Method of clearing:	Mechanical Removal
Tenure:	Mining Lease 08/497 Miscellaneous Licence 08/108
Location (LGA area/s):	Shire of Ashburton
Colloquial name:	Barradale Sands Project

### 1.2. Description of clearing activities

Barradale Sands Pty Ltd proposes to clear up to 48.025 hectares of native vegetation within a boundary of approximately 48.3 hectares, for the purpose of sand mining and associated activities. The project is located approximately 125 kilometres southeast from the Exmouth, within the Shire of Ashburton.

Clearing permit CPS 6794/1 was granted by the Department of Mines and Petroleum (now the Department of Mines, Industry Regulation and Safety) on 19 November 2015 and was valid from 12 December 2015 to 31 October 2020. The permit authorised the clearing of up to 27.195 hectares of native vegetation within a boundary of approximately 27.195 hectares, for the purpose of sand mining and associated activities.

CPS 6794/2 was granted on 13 December 2018, amending the permit to increase the amount of clearing authorised up to 48.025 hectares, increase the permit boundary to 48.3 hectares, and to extend the permit duration to 31 October 2023.

On 18 July 2023, the permit holder applied to amend clearing permit CPS 6794/2 to extend the permit duration to 31 October 2030. The amount of clearing authorised and the permit boundaries remain unchanged.

### 1.3. Decision on application and key considerations

Decision:	Granted
Decision date:	19 October 2023
Decision area:	48.025 hectares of native vegetation

### 1.4. Reasons for decision

This clearing permit application was made in accordance with section 51KA(1) of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Mines, Industry Regulation and Safety (DMIRS) on 18 July 2023. DMIRS advertised the application for public comment for a period of 7 days, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix A), relevant datasets (Appendix D), information provided by the applicant with mining proposals related to clearing permits CPS 6794/1 and 6794/2 (Milner, S, 2013; 2017), the clearing principles set out in Schedule 5 of the EP Act (Appendix C), 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 has not changed since the assessment for CPS 6794/2. The Delegated Officer determined that the proposed extension of duration is not likely to lead to an unacceptable risk to environmental values.

However, according to the Department of Mines, Industry Regulation and Safety's best practice guidelines; the Delegated Officer decided to grant the clearing permit CPS 6794/3 with extension of duration to 31 October 2030, subject to existing conditions on CPS 6794/2:

- commence proposed activities no later than three months after undertaking clearing to reduce the risk of erosion;
- avoid clearing of trees and vegetation within the drip line;
- take hygiene steps to minimise the risk of the introduction and spread of weeds; and
- avoid riparian vegetation where practical.

Additionally, a new condition will be implemented to:

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

## 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 the conservation of biological diversity and ecological integrity

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016 (WA) (BC 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)

## 3. Detailed assessment of application

### 3.1. Avoidance and mitigation measures

The applicant has indicated implementation of the following avoidance and mitigation measures (Milner, 2013; 2017)

- Implementation of a 2 metre buffer around all large trees and thick vegetation in the river.
- Sand extraction areas to be restricted to areas with minimal / ephemeral vegetation and non-vegetated areas.
- Speed limits of 40 kilometres per hour to reduce fauna mortality.
- The site induction to include an environmental element to ensure all staff and contractors are familiar with the potential environment values of the area (i.e. driving awareness, fire prevention and care of fauna).
- Ensuring vegetation within the river, including the root systems, are undisturbed and are not de-stabilised by mining activities.

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.

### 3.2. Assessment of impacts on environmental values

No biological surveys or supporting information were provided with the application. However, the information provided with the associated mining proposals (Milner, 2013; 2017) and advice received from Department of Water (now the Department of Water and Environmental Regulation) for mining proposal Reg ID 38422 (DoW, 2013) were utilised in this assessment.

In assessing the application, the Delegated Officer had regard to the site characteristics (Appendix A) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, land and water resource values. A review of current environmental information (Appendix A) reveals that the assessment against the clearing principles (Appendix B) has not changed from the previous versions of this decision report.

The assessment against the clearing principles (Appendix B) identified the impacts of the proposed clearing are limited and are able to be managed to be environmentally acceptable with standard conditions to avoid and minimise, weed hygiene, erosion management and vegetation management conditions.

### 3.3. Relevant planning instruments and other matters

The clearing permit amendment application was advertised on 11 August 2023 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application.

There is one native title claim (Thalanyji) over the area under application (DPLH, 2023). 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 is one lodged Aboriginal Cultural Heritage site within the application area (DPLH, 2023). It is the proponent's responsibility to comply with the *Aboriginal Cultural Heritage Act 2021* and ensure that no Aboriginal Cultural Heritage sites are damaged through the clearing process.

Other relevant authorisations required for the proposed land use include:

- A Mining Proposal / Mine Closure Plan approved under the *Mining Act 1978*.

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. Site characteristics

### A.1. Site characteristics

Characteristic	Details
Local context	<p>The area proposed to be cleared is located within the extensive land use zone of Western Australia (GIS Database). The application area is located approximately 125 kilometres southeast from the Exmouth and 300 kilometres southwest of Karratha on Yanarrie River. and adjacent area immediately south (300 m) of the Northwest Coastal Highway in the Shire of Ashburton (Milner, 2013)</p> <p>Spatial data indicates the local area (50 km radius from the centre of the application area) retains approximately 99 per cent of the original native vegetation cover (GIS Database).</p>
Ecological linkage	There are no ecological linkages identified within the application area (GIS Database).
Conservation areas	The nearest conservation area is Barlee Range National Park which is located approximately 85 kilometres southeast to the application area (GIS Database).
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation associations:</p> <p>641: Wheatbelt; York gum, salmon gum etc. <i>Eucalyptus loxophleba</i>, <i>E. salmonophloia</i>. Goldfields; gimlet, redwood etc. <i>E. salubris</i>, <i>E. oleosa</i>. Riverine; rivergum <i>E. camaldulensis</i>. Tropical; messmate, woolyb, and</p> <p>1601: Scrub or very open scrub / Grass-steppe (GIS Database).</p>
Vegetation condition	<p>Aerial imagery indicates the vegetation within the proposed clearing area is in excellent to completely degraded (Trudgen, 1991) condition. The completely degraded condition applies to the areas already cleared for mining infrastructure.</p> <p>The full Trudgen (1991) condition rating scale is provided in Appendix C.</p>
Climate and landform	<p>The application area lies between the winter rainfall parts of the state to the south and summer rainfall parts to the north and the weather is dominated by dry anticyclone pressure cells which constantly transverse from west to east (Milner, 2017).</p> <p>The average annual rainfall of the local area is recorded as approximately 300.5 mm (BoM, 2023).</p>
Soil Description	<p>Soils in the application area is mapped into two soil categories (Northcote et al.,1968; GIS Database):</p> <p><b>Oc40:</b> Alluvial plains, which are frequently badly surface eroded, and levees associated with prior streams: chief soils are hard alkaline red soils, together with various sandy alkaline red soils. There are small areas of sandy soils on levees and prior stream channels, and also small areas of red dune soils; and some sandy red earths. In places erosion has removed the sandy surfaces, and the resulting clay pans have sandy clay soils; and</p> <p><b>My53:</b> Extensive plains dominated by neutral red earths with areas of acid and alkaline red earths. There is frequently a cover of surface gravels. There are minor areas of soils adjacent to Robe River iron deposits and some hard red soils along creek lines.</p>
Land system	<p>The application area is broadly mapped as the Uaroo Land system (DPIRD, 2023).</p> <p><b>Uaroo Land System:</b> level sandy plains up to 10 kilometres or more in extent with little organised through drainage; pebbly surfaced plains and plains with calcrete at shallow depth; broad, mostly channelled, tracts receiving more concentrated sheet flow, minor low stony hills and rises. Broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered acacia shrubs (DPIRD, 2023). Occasionally some erosion and pasture decline is evident on drainage tracts, but generally the system is not susceptible to erosion or significant vegetation degradation (Van Vreeswyk et al., 2004).</p>
Land degradation risk	The Uaroo land system in not susceptible to the erosion (Van Vreeswyk et al., 2004). High susceptibility for subsurface acidification and low risk surface salinisation (DPIRD, 2023).

Characteristic	Details
Waterbodies	The application area is located within the Yannarie River, a north to west trending ephemeral, endoreic stream, drains into the middle of the Coastal Plains geomorphic province near Yanrey Station (Milner, 2013). Multiple drainage lines drain into the Yannarie River (GIS Database).
Hydrogeography	The application area is located in the Pilbara Surface and Groundwater Areas proclaimed under the <i>Rights in Water and Irrigation Act 1914</i> (GIS Database). It is located within the Yannarie River Catchment Area of the Lydon-Miniya Rivers basin (GIS Database) on rocks of low permeability, fractured and weathered rocks in local aquifers (GIS Database). The mapped groundwater salinity is 1,000-3,000 total dissolved solids milligrams per litre, which is described as brackish water quality (GIS Database).
Flora	No biological surveys have been undertaken within the application area. A desktop assessment indicated records of following Priority flora species within 50 kilometres of the application area (GIS Database): <i>Calandrinia</i> sp. Nanutarra (F. Obbens FO 08/18) (Priority 1) <i>Corchorus congener</i> (Priority 3) <i>Eragrostis crateriformis</i> (Priority 3) <i>Indigofera roseola</i> (Priority 1) <i>Triumfetta echinata</i> (Priority 3)
Ecological communities	No Threatened or Priority Ecological Communities (TEC or PEC) have been identified within 50 kilometres of the application area (GIS Database). The nearest TEC, <i>Themeda</i> grasslands ( <i>Themeda</i> sp. Hamersley Station (M.E. Trudgen 11431)) on cracking clays (Hamersley Station, Pilbara), is approximately 241 kilometres northeast of the application area (GIS Database).
Fauna	No conservation significant fauna records were identified within the application area (GIS Database).

## Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
<b>Environmental value: biological values</b>		
<p><u>Principle (a):</u> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared is not likely to contain significant flora or assemblages of plants. The riparian vegetation within the application area is identified as potential foraging habitat for fauna. However, the impact to the riparian vegetation will be minimised by the proponents' avoidance and mitigation measures (Section 3.1) and implementation of existing vegetation management conditions (Section 1.4). The application area is not likely to comprise of a high level of biodiversity (Milner, 2013; GIS Database).</p>	<p>Not likely to be at variance</p> <p>as per CPS 6794/2</p>	No
<p><u>Principle (b):</u> "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."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contains riparian habitat which may provide foraging and roosting habitats for conservation significant fauna (DoE, 2015). However, the proponent has committed to avoid the disturbance to the riparian vegetation and the trees (Milner, 2013; 2017). Potential impacts will further be minimised by the continued implementation of a vegetation management condition, which will assist in minimising the impacts to riparian vegetation.</p>	<p>May be at variance</p> <p>as per CPS 6794/2</p>	No
<p><u>Principle (c):</u> "Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared is unlikely to contain Threatened flora species listed under the BC Act or suitable habitat (GIS Database).</p>	<p>Not likely to be at variance</p> <p>as per CPS 6794/2</p>	No

Assessment against the clearing principles	Variance level	Is further consideration required?
<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>No Threatened Ecological Community (TEC) or Priority Ecological Community (PEC) have been identified within the application area (GIS Database). The nearest TEC, <i>Themeda</i> grasslands (<i>Themeda</i> sp. Hamersley Station (M.E. Trudgen 11431)) on cracking clays (Hamersley Station, Pilbara) is approximately 241 kilometres northeast of the application area (GIS Database). The proposed clearing is unlikely to impact the environmental values of this TEC.</p>	<p>Not likely to be at variance</p> <p><i>as per CPS 6794/2</i></p>	<p>No</p>
<b>Environmental value: significant remnant vegetation and conservation areas</b>		
<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 vegetation within the application area does not represent an area of significant remnant vegetation (Government of Western Australia, 2019).</p> <p>The extent of native vegetation in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia (GIS Database). The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area (GIS Database).</p>	<p>Not at variance</p> <p><i>as per CPS 6794/2</i></p>	<p>No</p>
<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>The nearest conservation area (Barlee Range National Park) is approximately 85 kilometres southeast of the application area (GIS Database). Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of Barlee Range National Park.</p>	<p>Not likely to be at variance</p> <p><i>as per CPS 6794/2</i></p>	<p>No</p>
<b>Environmental value: land and water resources</b>		
<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>The application area is located within the Yannarie River (GIS Database). The river is endoreic and ephemeral, and water flows only in times of heavy seasonal rainfall (Milner. S, 2013). The proponent has committed to avoiding clearing of riparian vegetation, larger trees and vegetation within their drip lines (Milner, 2013;2017). Therefore, the proposed clearing is unlikely to result significant impacts to the vegetation growing within Yannarie River. Potential impacts will be further managed by the continued implementation of a vegetation management, which will assist in minimising impacts to riparian vegetation and vegetation within the drip line of trees.</p>	<p>At variance</p> <p><i>as per CPS 6794/2</i></p>	<p>No</p>
<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>As per the site characteristics (Appendix A), the application area is not at risk of land degradation. Additionally, the proponent has committed to implement a 25 metre buffer from riverbanks and areas which are largely occupied by large trees to prevent excessive establishment and erosion than expected with natural flow events (Milner, 2013; 2017).</p> <p>Further degradation from weed invasion will be managed by the implementation of existing weed management and hygiene condition.</p>	<p>May be at variance</p> <p><i>as per CPS 6794/2</i></p>	<p>No</p>
<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>Not likely to be at variance</p> <p><i>as per CPS 6794/2</i></p>	<p>No</p>

Assessment against the clearing principles	Variance level	Is further consideration required?
Considering the site characteristics (Appendix A) and avoidance and mitigation methods, the proposed clearing is unlikely to impact the quality of surface and ground water (DoW, 2013).		
<p>Principle (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.”</p> <p><u>Assessment:</u></p> <p>Considering the natural topography of the Pilbara, the rivers and waterways are likely to flood post heavy rainfall events (Van Vreeswyk et al., 2004). Clearing of the vegetation on riverine system can increase risk of flooding. However, this will be mitigated by avoidance of clearing riparian vegetation (Vargas-Luna, A et al., 2015). Therefore, the proposed clearing is unlikely to increase the risk or incidence of flooding.</p>	Not likely to be at variance  as per CPS 6794/2	No

### Appendix C. 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 Trudgen, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.

#### Measuring vegetation condition for the Eremaean and Northern Botanical Provinces (Trudgen, 1991)

Condition	Description
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Very poor	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or ‘parkland cleared’ with their flora comprising weed or crop species with isolated native trees or shrubs.

### Appendix D. Sources of information

#### D.1. GIS databases

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

- 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 – Subsurface Acidification Risk (DPIRD-011)

- 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

## D.2. References

- Bureau of Meteorology (BoM) (2023) Bureau of Meteorology Website – Climate Data Online, Emu Creek Station (006072). Bureau of Meteorology. <http://www.bom.gov.au/climate/data/> (Accessed 15 September 2023).
- Department of Environment (DoE) (2015) EPBC Act Protected matters Report, Australian Government, 16 September 2015. URL: <https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool>
- 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](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) (2023) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. <https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS> (Accessed 20 September 2023).
- Department of Primary Industries and Regional Development (DPIRD) (2023) NRInfo Digital Mapping. Department of Primary Industries and Regional Development. Government of Western Australia. URL: <https://dpiird.maps.arcgis.com/apps/webappviewer/index.html?id=662e8cbf2def492381fc915aaf3c6a0f> (Accessed 15 September 2023).
- Department of water (DoW) (2013) Advice received in relation to Mining Proposal Reg ID: 38422. Department of Water and Environmental Regulation, Western Australia, 11 May 2013.
- Department of Water and Environmental Regulation (DWER) (2021) Procedure: Native vegetation clearing permits. Joondalup. Available from: [https://dwer.wa.gov.au/sites/default/files/Procedure\\_Native\\_vegetation\\_clearing\\_permits\\_v1.pdf](https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.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>
- Milner, S (2013) Mining Proposal (Reg ID 38422): M08/497 and L08/108 “Barradale Sands”, John Anthony Boyle and Kylie Leane Boyle, Austwide Mining Title Management Pty Ltd, Ashburton Mineral Field, Western Australia, January 2013.
- Milner, S (2017) Mining Proposal for Small Operations M08/497 & L08/108 “Barradale Sands” (Reg ID 64254), John Anthony Boyle, Austwide Mining Title Management Pty Ltd, Western Australia, February 2017.
- 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.
- Trudgen, M.E. (1991) Vegetation condition scale in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.
- 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.
- Vargas-Luna, A., Solari, L., Oorschot, M.V., and Geerling, G.W. (2015) Effect of vegetation on floods: The case of the River Magra, E-Proceeding of the 36<sup>th</sup> IAHR World Congress, 28 June-3 July 2015, The Hague, The Netherlands.
- Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed 20 September 2023).

## 4. Glossary

### Acronyms:

<b>BC Act</b>	<i>Biodiversity Conservation Act 2016</i> , Western Australia
<b>BoM</b>	Bureau of Meteorology, Australian Government
<b>DAA</b>	Department of Aboriginal Affairs, Western Australia (now DPLH)
<b>DAFWA</b>	Department of Agriculture and Food, Western Australia (now DPIRD)
<b>DCCEEW</b>	Department of Climate Change, Energy, the Environment and Water, Australian Government
<b>DBCA</b>	Department of Biodiversity, Conservation and Attractions, Western Australia
<b>DER</b>	Department of Environment Regulation, Western Australia (now DWER)
<b>DMIRS</b>	Department of Mines, Industry Regulation and Safety, Western Australia
<b>DMP</b>	Department of Mines and Petroleum, Western Australia (now DMIRS)
<b>DoEE</b>	Department of the Environment and Energy (now DCCEEW)
<b>DoW</b>	Department of Water, Western Australia (now DWER)
<b>DPaW</b>	Department of Parks and Wildlife, Western Australia (now DBCA)
<b>DPIRD</b>	Department of Primary Industries and Regional Development, Western Australia
<b>DPLH</b>	Department of Planning, Lands and Heritage, Western Australia
<b>DRF</b>	Declared Rare Flora (now known as Threatened Flora)
<b>DWER</b>	Department of Water and Environmental Regulation, Western Australia



<b>EP Act</b>	<i>Environmental Protection Act 1986</i> , Western Australia
<b>EPA</b>	Environmental Protection Authority, Western Australia
<b>EPBC Act</b>	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
<b>GIS</b>	Geographical Information System
<b>ha</b>	Hectare (10,000 square metres)
<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
<b>PEC</b>	Priority Ecological Community, Western Australia
<b>RIWI Act</b>	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
<b>TEC</b>	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.