



# Clearing Permit Decision Report

## 1. Application details and outcomes

### 1.1. Permit application details

Permit number:	9495/1
Permit type:	Purpose Permit
Applicant name:	Kumina Iron Pty Ltd
Application received:	17 November 2021
Application area:	106 hectares
Purpose of clearing:	Sand Quarry and Associated Activities
Method of clearing:	Mechanical Removal
Tenure:	General Purpose Lease 08/80 Mining Leases 08/488, 08/496
Location (LGA area/s):	Shire of Ashburton
Colloquial name:	Onslow Camp Dunes Project

### 1.2. Description of clearing activities

Kumina Iron Pty Ltd proposes to clear up to 106 hectares of native vegetation within a boundary of approximately 124.6 hectares, for the purpose of a sand quarry and associated activities. The project is located approximately 14 kilometres south of Onslow, within the Shire of Ashburton.

The application is to allow for an expansion of the pre-existing sand quarry and construction of associated infrastructure. The quarrying operation will extract sand from a raised sand dune crest to produce a range of sand products. The operations will include crushing and screening of excavated material. The associated infrastructure may include access roads, administration buildings, fuel storage, heavy vehicle workshops, water bores and laydown areas (MRL, 2021).

### 1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	19 May 2022
Decision area:	106 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 17 November 2021. DMIRS advertised the application for a public comment for a period of 21 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), including the results of a flora and vegetation, and fauna surveys, the clearing principles set out in Schedule 5 of the EP Act (Appendix B), 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 into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values; and
- potential land degradation.

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
- commence construction no later than three months after undertaking clearing to reduce the risk of erosion.

## 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 include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC 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 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2021)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

## 3. Detailed assessment of application

### 3.1. Avoidance and mitigation measures

The project was selected due to the proximity to established infrastructure, such as roads and port facilities (MRL, 2021). The site was also selected as there is pre-existing disturbance within the permit boundary, which will further reduce the need to clear additional vegetation (MRL, 2021). The permit holder has also committed to stockpiling salvaged vegetation and topsoil from clearing for use in progressive rehabilitation, or direct reapplication if suitable areas are available for rehabilitation at the time (MRL, 2021).

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

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A) 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 (flora and fauna). 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

Multiple flora surveys have previously been conducted over the application area and surrounding tenements that have been used to inform the most recent flora and vegetation survey in 2021 (MRL, 2021; 360 Environmental, 2021a). *Eleocharis papillosa* (P3) and *Eremophila forrestii* subsp. *viridis* (P3) were recorded during the 2021 survey within the vicinity of the application area (360 Environmental, 2021a; MRL, 2021). A database search also identified *Triumfetta echinate* (P3) approximately 1 kilometre from the application area (MRL, 2021). Vegetation types found within the application area have the potential to support these priority flora species (MRL, 2021). Approximately 14 hectares of the application area consists of suitable habitat for the above species (MRL, 2021). The vegetation types identified extend well beyond the application area, and are locally common (MRL, 2021).

360 Environmental (2021a) identified 1,061 *Eremophila forrestii* subsp. *viridis* and 270 *Eleocharis papillosa* individuals during the flora survey near the application area (MRL, 2021). The survey did not record any of these species within the application area (360 Environmental, 2021a). Given the number of individuals recorded outside the application area, the proposed clearing is unlikely to significantly impact the conservation status of these species or significantly reduce the extent of suitable habitat.

Three introduced flora species was recorded during two different flora surveys (360 Environmental, 2021a; MRL, 2021). Weeds have the potential to out-compete native flora and reduce the biodiversity of an area. Potential impacts to biodiversity as a result of the introduction of weeds may be minimised by the implementation of a weed management condition.

##### Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on habitat for Priority flora is not likely to be significant. There is a high likelihood of weeds being present within the application area and the proposed clearing has the potential to exacerbate the spread of weeds.

##### Conditions

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

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

### 3.2.2. Biological values (fauna) - Clearing Principles (b)

#### Assessment

The following three fauna habitats have been recorded within the application area (360 Environmental, 2021b):

- **Sand dunes and swales:** open *Triodia* grasslands and low, open *Acacia* shrublands on a soft sandy substrate which is preferred habitat for many burrowing taxa. Landform is comprised of alternating dunes and swales. Key microhabitats include termite mounds and hummocks. Cattle degradation was observed.
- **Tidal flat:** sparse, low *Tecticornia* shrubland and *Triodia* grassland. Sparse vegetation is of limited value as shelter for fauna taxa, however abundant large termite mounds provide shelter for a range of fauna taxa.
- **Claypan:** claypans are seasonally inundated after rainfall events and will provide seasonal habitat for wetland-dependent taxa, including migratory birds. This habitat was extensively degraded by cattle in many areas. The conservation significant Short-tailed Mouse is known to use the fringes of these habitats.

No conservation significant fauna species were recorded within the application area during the fauna survey, however there are three species that have the potential to occur within the habitats listed above based on nearby records and known distribution:

- northern quoll (*Dasyurus hallucatus*, EN)
- northern short-tailed mouse (*Leggadina lakedownensis*, P4)
- brush-tailed mulgara (*Dasymercus blythi*, P4)

Northern quoll footprints and scats were observed within sand dunes and swale habitat approximately 2.8 kilometres east of the application area (360 Environmental, 2021b). The sand dunes and swale habitat is considered potential foraging habitat for northern quolls (360 Environmental, 2021b). The fauna survey covered a much larger area, with northern quolls recorded on camera traps 74 kilometres east of the application area (360 Environmental, 2021b). The camera trap records were located within mesas and breakaway habitat, and stony hills and slopes habitat, neither of these habitats are found within the application area (360 Environmental, 2021b). The application area does not contain any known denning habitat for northern quolls (260 Environmental, 2021b). The distance of the footprints and scats from confirmed northern quoll presence suggests that the footprints and scats belong to a transient male (360 Environmental, 2021b). Given that the sand dunes and swale habitat was recorded well beyond the application area, the proposed clearing of 69.92 hectares of this habitat type is unlikely to significantly reduce potential foraging habitat for any northern quoll individuals (360 Environmental, 2021b). The distance from the nearest known location of a northern quoll population suggests that the proposed clearing is unlikely to represent habitat necessary for the maintenance of this species (360 Environmental, 2021b).

The northern short-tailed mouse's preferred habitat occurs primarily within tidal flats and claypan habitats (360 Environmental, 2021b). A desktop assessment identified nearby records of northern short-tailed mouse, 3 kilometres north and 5 kilometres west (MRL, 2021; 360 Environmental, 2021b). While this species wasn't recorded during the field survey, it can be difficult to detect without intensive survey effort given that it occurs in small, scattered populations (MRL, 2021; 360 Environmental, 2021b). Given that the northern short-tailed mouse's preferred habitat extends well beyond the application area and that none were recorded during the field survey, the proposed clearing is unlikely to significantly reduce available habitat for this species (360 Environmental, 2021b).

Brush-tailed mulgara tracks were recorded within the application area in 2011 (MRL, 2021). A targeted fauna survey was undertaken in 2013 which did not record any presence of brush-tailed mulgara despite intensive trapping for five nights (MRL, 2021). This species is considered to have a high likelihood of occurrence within the application area, however it is unlikely that the proposed clearing will significantly reduce available brush-tailed mulgara habitat (MRL, 2021). The fauna habitats found within the application area were recorded in the surrounds and are common in the region (MRL, 2021; 360 Environmental, 2021b).

#### Conclusion

Based on the above assessment, the proposed clearing will result in some loss in potential habitat for northern quolls, northern short-tailed mouse, and brush-tailed mulgara. The proposed clearing is unlikely to be significant either due to the distance or age of the nearest or most recent records of any of these species. The fauna habitats found within the application area extend well beyond into the surrounds, and are common in the region.

#### Conditions

No fauna management conditions are required.

### 3.3. Relevant planning instruments and other matters

There are no native title claims over the area under application (DPLH, 2022). 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.

Other relevant authorisations that may be required for the proposed land use include:

- A Programme of Work approved under the *Mining Act 1978*.

- 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	The application is located approximately 14 kilometres south of Onslow. The area proposed to be cleared is in the extensive land use zone of Western Australia and is an expansion of a pre-existing sand quarry. It is located approximately 11.4 kilometres from the coast.
Conservation areas and ecological linkage	There are no conservation areas located within or adjacent the application area. The nearest conservation area is the Mt Minnie former pastoral lease, located approximately 6 kilometres southeast of the application area. The proposed clearing does not represent a significant remnant of native vegetation in an area that has been extensively cleared, and is unlikely to provide an ecological linkage to surrounding areas.
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation association:</p> <p>670: Hummock grasslands, shrub steppe; scattered shrubs over <i>Triodia basedowii</i> (GIS Database).</p> <p>A flora and vegetation survey was conducted over the application area and surrounds by 360 Environmental across seven field trips between June 2020 and May 2021. The following vegetation types were recorded within the application area (360 Environmental, 2021a):</p> <p><b>CT02:</b> <i>Tecticornia auriculata</i> and <i>Tecticornia halocnemoides</i> low open chenopod shrubland with <i>Triodia epactia</i> low open hummock grassland.</p> <p><b>CT03:</b> <i>Tecticornia auriculata</i> (<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>) low open chenopod shrubland to isolated chenopod shrubs (+/- *<i>Cenchrus ciliaris</i> low isolated tussock grasses).</p> <p><b>CT04:</b> Tidal flats/open clay pans with low isolated herbs and chenopod shrubs.</p> <p><b>CT07:</b> <i>Acacia tetragonophylla</i> and <i>Acacia synchronicia</i> (and/or *<i>Vachellia farnesiana</i>) tall to mid open shrubland over <i>Eriachne flaccida</i> and <i>Sporobolus mitchellii</i> open tussock grassland to isolated tussock grasses.</p> <p><b>DS01:</b> <i>Grevillea stenobotrya</i> and <i>Hakea stenophylla</i> subsp. <i>stenophylla</i> (+/- <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>) tall to mid open to sparse shrubland over <i>Acacia stellaticeps</i> low sparse shrubland to isolated shrubs over <i>Triodia avenoides</i> and <i>Triodia epactia</i> low open hummock grassland.</p> <p><b>DS02:</b> <i>Acacia stellaticeps</i> (+/- <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>) mid to low open shrubland over <i>Triodia epactia</i> (+/- <i>Triodia avenoides</i>, <i>Triodia glabra</i>) low hummock grassland.</p> <p><b>DS03:</b> (+/- <i>Acacia tetragonophylla</i>, <i>Acacia tetragonophylla</i> x <i>trachycarpa</i> and/or <i>Acacia synchronicia</i> mid to low sparse shrubland over) <i>Triodia epactia</i> low hummock grassland.</p> <p>* denotes weed species.</p>
Vegetation condition	The vegetation survey (360 Environmental, 2021a) indicated the vegetation within the proposed clearing area is in good, degraded, and completely degraded (Keighery, 1994) condition. The full Keighery (1994) condition rating scale is provided in Appendix C.
Climate and landform	The climate of the region is arid, semi-desert to subtropical climate, with variable summer and winter rainfall. The annual average rainfall is approximately 303.8 millimetres per year.
Soil description and land degradation risk	<p>The application area is mapped as part of the Dune and Onslow land systems. The Dune land system is described as dune fields supporting soft spinifex grasslands. Potential wind erosion occurs when vegetation cover is reduced or removed.</p> <p>The Onslow land system is described as sandplains, dunes and clay plains supporting soft spinifex grasslands and minor tussock grasslands. This land system is susceptible to erosion when vegetation cover is reduced or removed.</p>
Waterbodies and hydrogeography	The desktop assessment and aerial imagery indicated that no perennial or ephemeral watercourses transect the area proposed to be cleared. The application area is located within the Pilbara Groundwater Area and the Pilbara Surface Water Area. The mapped groundwater salinity is 7,000-14,000 milligrams per litre total dissolved solids which is described as saline to hypersaline.

Characteristic	Details
Flora	There are no previous records of Threatened or Priority flora within the application area. A recent survey by 360 Environmental (2021a) did not record any threatened or priority flora within the application area. The survey recorded <i>Eremophila forrestii</i> subsp. <i>viridis</i> (P3) within the surrounds, with the nearest record 76 metres from the application area.
Ecological communities	There are no mapped Priority or Threatened Ecological Communities within the application area. There nearest known PEC is the Tanpool Land System (P1), located approximately 52 kilometres east of the application.
Fauna	No conservation significant fauna species have previously been recorded within the application area. A recent fauna survey by 360 Environmental (2021b) opportunistically recorded northern quolls approximately 2.8 kilometres east of the application area.

## 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><b>Principle (a):</b> “Native vegetation should not be cleared if it comprises a high level of biodiversity.”</p> <p><b>Assessment:</b> The area proposed to be cleared contains potential habitat for several species of Priority flora.</p>	Not likely to be at variance	Yes Refer to Section 3.2.1, above.
<p><b>Principle (b):</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.”</p> <p><b>Assessment:</b> The area proposed to be cleared contains suitable foraging habitat for northern quoll (<i>Dasyurus hallucatus</i>, EN), and potential breeding and foraging habitat northern short-tailed mouse (<i>Leggadina lakedownensis</i>, P4), and brush-tailed mulgara (<i>Dasyercus blythi</i>, P4).</p>	Not likely to be at variance	Yes Refer to Section 3.2.2, above.
<p><b>Principle (c):</b> “Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</p> <p><b>Assessment:</b> There are no known records of Threatened flora within the application area (GIS Database). A flora survey of the application area did not record any species of Threatened flora and the vegetation is not expected to support any species of Threatened flora (360 Environmental, 2021a).</p> <p>The vegetation types recorded within the application area are common and widespread within the region (360 Environmental, 2021a; GIS Database). The vegetation proposed to be cleared is unlikely to be necessary for the continued existence of any species of Threatened flora.</p>	Not likely to be at variance	No
<p><b>Principle (d):</b> “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.”</p> <p><b>Assessment:</b> There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the application area (GIS Database). Flora and vegetation surveys of the application area did not identify any vegetation that would part of a TEC (360 Environmental, 2021a).</p>	Not likely to be at variance	No
<b>Environmental value: significant remnant vegetation and conservation areas</b>		
<p><b>Principle (e):</b> “Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</p> <p><b>Assessment:</b> The application area falls within the Carnarvon Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 99% of the pre-European vegetation still exists in the IBRA Carnarvon Bioregion (Government of Western Australia, 2019). The application area is broadly mapped as Beard vegetation association 670: Hummock grasslands, shrub steppe; scattered shrubs over <i>Triodia basedowii</i> (GIS Database). Approximately 99.9% of the pre-European extent of this vegetation association remains uncleared at both the state and bioregional level (Government of Western Australia, 2019).</p>	Not at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
<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> There are no conservation areas in the vicinity of the application area. The nearest DBCA (formerly DPaW) managed land is the Mt Minnie former pastoral lease which is located approximately 6 kilometres southeast of the application area (GIS Database). The proposed clearing is unlikely to impact on the environmental values of any conservation area.</p>	Not likely to be at variance	No
<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> Given no water courses or wetlands are recorded within the application area, the proposed clearing is unlikely to impact on any vegetation growing in association with a watercourse or wetland.</p>	Not 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> The application area lies within the Dune and Onslow 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).</p> <p>The Dune land system is described as dune fields supporting soft spinifex grasslands (Van Vreeswyk et al., 2004). Potential wind erosion occurs when vegetation cover is reduced or removed (Van Vreeswyk et al., 2004).</p> <p>The Onslow land system is described as sandplains, dunes and clay plains supporting soft spinifex grasslands and minor tussock grasslands (Van Vreeswyk et al., 2004). This land system is susceptible to erosion when vegetation cover is reduced or removed (Van Vreeswyk et al., 2004).</p> <p>Potential erosion may be adequately minimised through a staged clearing condition that will require the permit holder to enact the purpose for which the clearing is authorised within three months of clearing.</p>	May 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> There are no Public Drinking Water Source Areas within or in close proximity to the application area (GIS Database). There are no permanent or ephemeral watercourses or wetlands within the area proposed to clear (GIS Database). The proposed clearing is unlikely to result in significant changes to surface water flows or to cause deterioration in the quality of underground water.</p>	Not likely to be at variance	No
<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> The climate of the region is arid, semi-desert to subtropical climate, with variable summer and winter rainfall. The annual average rainfall is approximately 303.8 millimetres per year (BoM, 2022; CALM, 2002).</p> <p>There are no permanent or ephemeral water courses or waterbodies within the application area (GIS Database). The proposed clearing is unlikely to increase the incidence or intensity of natural flooding events.</p>	Not likely to be at variance	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 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 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)
- 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)

#### D.2. References

- 360 Environmental (2021a) Ashburton Infrastructure Project. Flora and Vegetation Assessment. Prepared for Mineral Resources Limited, by 360 Environmental, September 2021
- 360 Environmental (2021b) Ashburton Infrastructure Project. Vertebrate Fauna and Short-Range Endemic Invertebrate Fauna Assessment. Prepared for Mineral Resources Limited, by 360 Environmental, September 2021.
- BoM (2022) Bureau of Meteorology Website – Climate Data Online, Onslow Airport. Bureau of Meteorology. <http://www.bom.gov.au/climate/data/> (Accessed 12 May 2022).
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.
- Department of Environment Regulation (DER) (2013) 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) (2022) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. <https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS> (Accessed 12 May 2022).
- 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)
- 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](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf)
- Environmental Protection Authority (EPA) (2016) Technical Guidance – Terrestrial Fauna Surveys. Available from: [https://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.pdf](https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.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>
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- MRL (2021) Onslow Camp Dunes Project. Clearing Permit Supporting Documentation M08/488, M08/496, G08/80. Mineral Resources Limited, November 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.

## 4. Glossary

### Acronyms:

<b>BC Act</b>	<i>Biodiversity Conservation Act 2016, Western Australia</i>
<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>DAWE</b>	Department of Agriculture, Water and the Environment, 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 DAWE)
<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, Western Australia</i>
<b>EPA</b>	Environmental Protection Authority, Western Australia
<b>EPBC Act</b>	<i>Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)</i>
<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, Western Australia</i>
<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.