



Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	9596/1
Permit type:	Purpose Permit
Applicant name:	Rio Tinto Exploration Pty Ltd
Application received:	28 January 2022
Application area:	125 hectares
Purpose of clearing:	Access Road
Method of clearing:	Mechanical Removal
Tenure:	Miscellaneous Licenses 45/476, 45/491, 45/494, 45/548, 45/549, 45/551, 45/552
Location (LGA area/s):	Shire of Broome and Shire of East Pilbara
Colloquial name:	Paterson Province Access Road Project

1.2. Description of clearing activities

Rio Tinto Explorations Pty Ltd proposes to clear up to 125 hectares of native vegetation within a boundary of approximately 2,357.274 hectares, for the purpose of expanding access road The project occurs from the Great Northern Highway, located approximately 185 kilometres north-east of Port Hedland, to the existing emergency airstrip of the Winu Project, comprising the roads known as Nyangumarta Highway, Wirkirri Wirkirri Road (aka Old Dump Road), Copperhead Road and Airport Drive, within the Shire of East Pilbara and Broome.

The application is to allow for upgrading an existing road used to provide access for investigation and exploration activities within the Paterson Province. The upgraded access road will allow future development and operations of the Winu Project.

Decision:	Grant
Decision date:	13 January 2023
Decision area:	125 hectares of native vegetation

1.3. 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 28 January 2022. DMIRS advertised the application for public comment for a period of 21 days on 25 February 2022, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix B), relevant datasets (Appendix E) supporting information provided by the applicant (Appendix A) including the results of a flora and vegetation survey, the clearing principles set out in Schedule 5 of the EP Act (0), 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;
- impacts to conservation significant flora; and
- impacts to habitat for conservation significant fauna.

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 is unlikely to have long-term adverse impacts on conservation significant flora and the impacts of the 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:

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

- take hygiene steps to minimise the risk of the introduction and spread of weeds;
- no clearing of native vegetation within 10 m of known locations of *Bonamia oblongifolia* (P3) and *Indigofera ammobia* (P3); *Dasymalla chorisepala* (P3) and *Tribulopsis marliesiae* (P3);
- No more than 7,495 individuals of *Goodenia hartiana* (P2) to be cleared;
- Pre-clearing inspections for the greater bilby, great desert skink and mulgara to be carried out before clearing activities commence;
- A fauna management condition requiring a fauna spotter to traverse the project area ahead of clearing machinery at the time of clearing, and alert machinery operators to avoid injury or mortality to native fauna and relocate them when possible.

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 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016a)
- Technical guidance – *Sampling for Short range endemic Invertebrate Fauna* (EPA, 2016b)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2020)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

The applicant has provided the following avoidance and mitigation measures to support this clearing permit application:

- The access road has been designed to follow an existing track for the majority of its length;
- Conduct pre-clearance burrow surveys to ascertain no active Bilby borrows are present within highly prospective habitats (Preston, 2021);
- Night travel ban, except in the case of an emergency which requires an exemption (RTX, 2022); and
- Implementation of the Black-footed Rock-wallaby Action Plan to reduce potential interaction and impacts for this species (RTX, 2022).

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 B) 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) and (c)

Assessment

Several flora and vegetation surveys have been undertaken within the Paterson Province Access Road Project (PPAR) and its surrounding areas. These surveys include:

- 1) Biota (2018a) – Asian Renewable Energy Hub Detailed Vegetation and Flora Survey (AREH) (survey conducted in August - September 2017 and March 2018);

- 2) Astron (2019) – Paterson Road Corridor Reconnaissance Flora and Vegetation and Level 1 Fauna Survey (conducted in May 2019);
- 3) Biota (2020a) Winu Project Detailed Flora and Vegetation Survey (conducted in August 2019); and
- 4) Biota (2021) Winu Project Detailed Flora and Vegetation Survey (conducted in August 2019 and July 2020).

Other numerous flora and vegetation surveys were conducted in the region since 2018, which are described by Biota (2020a; 2021).

During the assessment, and following discussions with DMIRS, the proponent prepared a Memorandum regarding data reconciliation (Preston, 2022b), rectifying the flora species results within the application area and the potential impacts from the native vegetation clearing.

A total of 218 species from 101 genera and 41 families were recorded in the compiled species list for the application area (Biota, 2021). The most common families were Fabaceae, Poaceae, Malvaceae, and Proteaceae (Biota, 2021).

One Threatened flora (*Seringia exastia*) was recorded within the project area in a survey conducted by Biota in 2018, however this is no longer of conservation significance (Biota, 2020a). A taxonomic study concluded that *Seringia exastia* is the same species as *Seringia elliptica* (Binks et al., 2020). *Seringia elliptica* is common species and has a range that extends throughout the Pilbara region, central Western Australia, the Northern Territory and into South Australia (Western Australian Herbarium, 1998-). The taxonomy of the genus has been revised to synonymise *Seringia elliptica* under *Seringia exastia* as it is the oldest effectively published name (Binks et al., 2020). This has resulted in *Seringia exastia* classed as a common and widespread species with no significant threats. The Western Australian Threatened Species Scientific Committee is currently delisting this species (DBCA, 2022).

Six Priority flora species were recorded within the application area (Biota 2021; Preston, 2022b):

- *Goodenia hartiana* (P2);
- *Bonamia oblongifolia* (P3);
- *Seringia katatona* (P3);
- *Indigofera ammobia* (P3)
- *Tribulopsis marliesiae* (P3); and
- *Dasymalla chorisepala* (P3).

Approximately 44,848 individuals of *Goodenia hartiana* (P2) were recorded within the application area (Biota, 2021; Preston, 2022b). It was reported that a total of 230,535 individuals of this species were recorded in a broader survey area; however, RTX (2022) identified that 7,495 individuals may be impacted by the proposed clearing based on the final design of the road project (Preston, 2022b). *Goodenia hartiana* appears to respond well to fire, as it was found in large numbers in burnt areas (Biota, 2021). However, it is unlikely that the species will remain in such high numbers once the vegetation recovers post-fire (Biota, 2021; Preston, 2022b). It is likely that this species has been poorly documented in the Great Sandy Desert due to limited botanical sampling in the region (Biota, 2020a).

According to Preston (2021), *Bonamia oblongifolia* (P3) has been recorded in multiples surveys throughout the region in the last five years, and it was well represented across surveys at Wallal Downs, Pardoo and Anna Plain Stations (Biota, 2021). Therefore, the species is unlikely to be uncommon in suitable habitat (Biota, 2021). However, the Western Australian Herbarium (1998-) has few registrations of this species and only two individuals were identified within the application area, with no other records in the broader survey area (Preston, 2022b). As these are the only records identified within the survey area, the proposed clearing activities have the potential to impact the conservation significance of this species on a local scale.

There were 150 individuals of *Seringia katatona* (P3) were recorded within the application area. However, genetic analysis was carried out and discovered that *S. katatona* is a hybrid between *S. exastia* and *S. nephrosperma* (Binks et al., 2020), and therefore, is no longer listed as a conservation significant flora (Western Australian Herbarium, 1998-).

One record of *Indigofera ammobia* (P3) was identified within the application area, and approximately 1,017 individuals were recorded across the Winu Project Area and Winu Re-Injection Borefield (Biota, 2021; Preston, 2022b). However, the Winu Project Area and the Winu Re-Injection Borefield are areas proposed for future operations; hence, the individuals recorded within these areas could be impacted by future clearing activities. This species was recorded predominantly in vegetation associated with dune systems, hence it is expected to occur more widely through the area in similar habitats (Biota, 2021). This individual is not expected to be impacted by the proposed clearing (Preston, 2022a).

There were 16 individuals of *Tribulopsis marliesiae* (P3) and 5 individuals of *Dasymalla chorisepala* (P3) recorded within the application area (Preston, 2021; 2022b). It is reported that 227 and 26 individuals of each respective species were identified in the broader survey area; however, none of the records of both species are predicted to be impacted by the proposed clearing (Preston, 2022b).

One type of vegetation was considered of local significance as it supports large populations of some of the Priority species (Biota, 2020a). This vegetation is comprised of *Owenia reticulata*, *Erythrophleum chlorostachys* scattered low trees over *Acacia platycarpa* open shrubland over *Jacksonia aculeate*, and (*Androcalva loxophylla*, *Dicrastylis cordifolia*, *Gompholobium simplicifolium*, *Seringia elliptica*) low shrubland over *Triodia schinzii* open hummock grassland (Biota, 2020a). However, this vegetation accounts for 1.77% of the mapped vegetation within the proposed access road project (Preston, 2021).

Overall, the proposed access road represents only a small narrow portion of broad recorded vegetation types that are known to occur outside of the application area (Preston, 2021).

No weeds were recorded during the flora and vegetation assessment of the application area (Biota, 2020a). However, it is possible that common roadside weed species such as Buffel Grass (*Cenchrus ciliaris*), Birdwood Grass (*Cenchrus setiger*) and Kapok Bush (*Aerva javanica*) may be present (Biota, 2020a). Weeds have the potential to out-compete native flora and reduce the biodiversity of an area.

Conclusion

Based on the above assessment, it is considered that the impacts of the proposed clearing on potential habitats for Priority flora are not likely to be significant if avoidance, mitigation and management measures are implemented.

For the reasons set out above, it is considered that the impacts of the proposed clearing on potential habitats for conservation significant flora species can be managed with conditions to be environmentally acceptable. There is potential for 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:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds;
- no clearing of more than 7,495 individuals of *Goodenia hartiana* (P2);
- no clearing of native vegetation within 10 meters of known locations of *Bonamia oblongifolia* (P3);
- no clearing of native vegetation within 10 meters of known locations of *Indigofera ammobia* (P3);
- no clearing of native vegetation within 10 meters of known locations of *Tribulopsis marliesiae* (P3); and
- no clearing of native vegetation within 10 meters of known locations of *Dasymalla chorisepala* (P3).

3.2.2. Biological values (fauna) - Clearing Principles (a) and (b)

A number of fauna surveys have been undertaken within the Paterson Province Access Road Project (known as WRAC – Winu Road Access Corridor in survey reports) and in surrounding areas (Biota, 2018b; 2020b; 2020d; 2020e). Biota (2020b) identified five broad habitats within the application area: Shrub and spinifex on sandplain; longitudinal sand plain ridge; gravelly lateritic rise; and rock outcropping.

A total of 144 vertebrate fauna species were recorded within part of the application area (referred as section 2 of the WRAC), including 17 of conservation significance (six ground fauna and 11 migratory birds). There were six conservation significant fauna recorded within the application area:

- Black-footed Rock-wallaby (*Petrogale lateralis lateralis*) - BC Act and EPBC Act Endangered
- Northern Quoll (*Dasyurus hallucatus*) - BC Act and EPBC Act Endangered;
- Bilby (*Macrotis lagotis*) – BC Act and EPBC Act Vulnerable;
- Western Pebble-mound Mouse (*Pseudomys chapmani*) – Priority 4;
- Northern Marsupial Mole (*Notoryctes caurinus*) – Priority 4; and
- Dampierland plain slider (*Lerista separanda*) - Priority 2.

An additional four conservation significant species are likely to occur within the application area due to habitat availability: the Brush-tailed Mulgara (*Dasyercus blythi*) – P4; Fork-tailed Swift (*Apus pacificus*) – Migratory; Little Curlew (*Numenius minutus*) - Migratory; and Oriental Plover (*Charadrius veredus*) – Migratory. The Brush-tailed Mulgara is likely to occur in suitably vegetated habitats that have not been disturbed (Biota, 2020b). Migratory birds are likely to appear occasionally for foraging, while others that do not rely on terrestrial habitats, may episodically flyover the application area (Biota, 2020b).

Black-footed Rock-wallaby was recorded during the fauna survey and the findings revealed a previously unknown colony located near the proposed access road (Biota, 2018b). Six of the nine rock piles inspected near the application area had evidence (scats) of this species. The rock piles where this species was recorded were identified as an essential and restricted habitat for this species in the region (Biota, 2020b). This habitat is likely to be utilised by the Northern Quoll as well in a transient capacity (Biota, 2020b). An Action Plan for Black-footed Rock Wallaby has been developed by Rio Tinto Exploration to mitigate potential threats to this species, including prohibition of night travel. The habitats for these species are located outside of the proposed access road; however, indirect impacts might occur.

A Northern Quoll scat was recorded within the application area (Biota, 2020b). However, no evidence of denning (larger scat piles or individuals detected on cameras or cage traps) were recorded (Biota, 2020b). Even though this species is considered to occur more in a transient basis throughout the survey area, they represent one of the most northerly records in the Pilbara (Biota, 2020b). Therefore, despite the low probability that the clearing activities will significantly impact the habitat for this species, a fauna management condition requiring a pre-clearance check to relocate individuals if present is recommended in order to minimise potential impacts to this species.

Biota (2020b) identified that the majority of the application area and its surroundings has high to moderate habitat prospectivity for bilbies. Evidence of this species were recorded within the application area and its surroundings (Preston, 2021; GIS Database). The vegetation within the application area is unlikely to represent significant habitat for this species due to the narrow and long shape of the proposed clearing (averaging 20 metres width proposed for the construction or widening of access road) (Preston, 2021). However, despite the broad range of bilby habitats mapped by Biota (2020b) and the nature of the clearing (access road), potential impacts on local populations of this species may occur and be significant considering the vulnerability status of this species. Therefore, in line with RTX existing Environmental Management Plan (Preston, 2021) it is

recommended a fauna management condition requiring a pre-clearance survey to check for active burrows and fauna relocation if present.

Great Desert Skink (*Liopholis kintorei*) and Short-tailed Mouse (*Leggadina lakedownensis*) were classified as potentially occurring in the area although signs of these species have not been detected during the field survey (Biota, 2020b). It must be noted that not all areas were ground-truthed, therefore, it was not possible to confidently confirm that the Great Desert Skink does not occur within the application area or surrounding areas (Biota, 2022e). Therefore, a fauna management condition is recommended to minimise potential impacts to the Great Desert Skink.

The vegetated sandplain habitats within the application area and surroundings support the Dampierland plan slider (*Lerista separanda*) and Brush-tailed Mulgara (*Dasymercus blythi*) (Biota, 2020b). *Lerista separanda* was known to occur solely from the Dampier Peninsula; however, the recent records found within and in the vicinity of the application area potentially indicate a further range extension for this species (Biota, 2020b). Therefore, a fauna management condition is recommended to minimise potential impacts to the Dampierland plan slider.

Shrub and spinifex on sandplain habitat zone are potential habitats for the Night Parrot (*Pezoporus occidentalis*, BC Act Critically Endangered, EPBC Act Endangered). However due to recent burning in the area, there is a scarcity of mature spinifex hammocks. Despite a targeted survey, no night parrots were recorded within the application area or surroundings (Biota, 2021).

The survey for short-range endemic (SRE) species resulted in total of 63 invertebrate specimens, and it revealed three potential SRE mygalomorph spider species (*Aname* sp. N138, *Aname* sp. 139 and *Aname* sp. N140) occurring within the application area (Biota, 2020b). It is noted that SRE species have poor dispersal powers and the areas they occupy may be small, discontinuous or fragmented (EPA, 2016b; Harvey, 2002). In addition, higher temperatures tend to drive adult spiders to have a short-distance movement (Bonte et al., 2008). Given their potential to be restricted at small spatial scales (EPA, 2016b), these species are more susceptible to the risk of extinction than others, mainly due to threatening process which includes clearing of native vegetation (EPA, 2016b). Therefore, a fauna management condition has been placed in the clearing permit to minimise impacts to this species. Due to the unknown scientific data on home ranges for SRE spider species, specifically for the genera *Aname*, a conservative approach was taken comparing the results of other spider species home ranges. Seer et al. (2015) described an average home range between approximately 143 to 182 meters squared for wolf spiders. Therefore, 10 metre buffer around known locations of *Aname* sp. would provide roughly 314 meters squared habitat coverage, and therefore, protection of their estimated home range. This buffer considers potential GPS margin errors and prevents people from accidentally getting too close to the known records and their respective home ranges.

Northern marsupial mole have been recorded within the application area and its preferred habitat identified during the survey was the longitudinal sand dune ridges (Preston, 2021). However, this habitat type occupies 0.24% of the mapped extent, and this species would typically occupy the interconnected dunes which would provide dispersal opportunities (Preston, 2021).

Three mounds of the western pebble-mound mouse were detected within part of the application area (Biota, 2020a; Preston, 2021). However, this species is known from a broader extent of the Pilbara region and into the Gascoyne as well and the proposed clearing is not likely to represent significant habitat for this species (Preston, 2021). One of the three mounds recorded was classified as active (Biota, 2021).

The proposed clearing is unlikely to impact any fauna species at a regional scale as the majority of the fauna habitats mapped within the application area are common and well represented beyond the permit boundaries. However, the clearing may directly impact individual fauna and at a local scale by the reduction of appropriate habitat. Potential impacts to the bilby, brush-tailed mulgara, great desert skink, Dampierland plain slider, western pebble-mound mouse and northern marsupial mole as a result of the proposed clearing may be minimised by the implementation of a fauna management condition which requires the relocation of any individuals found within the path of the clearing.

Conclusion:

Based on the above assessment, it is considered that the impacts of the proposed clearing on potential habitats for conservation significant species are not likely to be significant if avoidance, mitigation and management measures are implemented.

For the reasons set out above, it is considered that the impacts of the proposed clearing on potential habitats for conservation significant fauna species can be managed with conditions to be environmentally acceptable.

Conditions:

While low impact to the above habitats and species is anticipated, the below measures will require implementation to further reduce risk to these findings.

- Pre-clearing inspections for greater bilby, mulgara and great desert skink to be carried out before clearing activities commence;
- A fauna management condition requiring a fauna spotter to traverse the project area ahead of clearing machinery at the time of clearing, and alert machinery operators to avoid injury or mortality to native fauna and relocate them when possible; and
- no clearing of native vegetation within 10 metres of known locations of *Aname* N138, *Aname* 139 and *Aname* N140.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 24 February 2022 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application.

There are two native title claims (WC1996/078 and WC1998/065) over the area under application (DPLH, 2022). These claims have been registered with the National Native Title Tribunal on behalf of the claimant groups. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There 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 throughout 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. Additional information provided by applicant

Summary of comments	Consideration of comment
Detailed flora and vegetation survey	A detailed flora and vegetation survey was conducted by Biota (2018a) for the Asian Renewable Energy Hub Project. The survey covered the middle section of the proposed access road, identified as section 2 in the report, but it also encompassed a broader and adjacent areas of the proposed permit boundary. The detailed survey was used to inform assessment of potential impacts to conservation significant flora.
Reconnaissance flora and vegetation and Level 1 fauna survey	Astron (2019) undertook a reconnaissance flora and vegetation survey and basic fauna survey for the proposed access road, named as Paterson Road Corridor in the survey. The survey covered the northern section of the application area. The survey was used to inform assessment of clearing principles (a), (b) and (c).
Detailed flora and vegetation survey	A detailed flora and vegetation survey was conducted by Biota (2020a) and a reviewed version (Biota, 2021) was later provided to DMIRS. The survey covered a majority of the proposed access road, named as Winu Road Access Corridor in the survey. The detailed survey was used to inform assessment of potential impacts to conservation significant flora.
Terrestrial fauna survey	A terrestrial survey was undertaken by Biota (2020b). The survey covered and compiled the whole application area. The fauna survey was used to inform assessment of clearing principles (a) and (b).
Targeted survey and abundance study for Bilby (<i>Macrotis lagotis</i>)	Biota (2020c) undertook a targeted survey for Bilby (<i>Macrotis lagotis</i>) and its abundance within the Winu Project. The survey covered an adjacent area (the mine) of the proposed permit boundary. This survey was important to inform the abundance of this species in a local and regional context, and potential impacts to populations of this conservation significant species.
Short range endemic invertebrate fauna survey	A short-range endemic invertebrate fauna survey was undertaken by Biota (2020d). The survey covered a section (referred as section 2 in the report) of the proposed access road. The results were used to inform assessment of clearing principles (a) and (b).
Likelihood of Occurrence of Great Desert Skink (<i>Liopholis kintorei</i>) in the Winu Area	A likelihood of occurrence assessment of Great Desert Skink (<i>Liopholis kintorei</i>) has been conducted in the Winu Area, adjacent to the application area, by Biota (2020e). The survey was used to inform assessment of clearing principles (a) and (b).
Memorandums – Response to Queries CPS 9695/1 - Paterson Province Access Road	Two memorandums were provided during the course of the assessment in order to rectify data and clarify the results of flora surveys. The memorandums were prepared by Preston (2022a; 2022b) for Rio Tinto Explorations Pty Ltd.

Appendix B. Site characteristics

B.1. Site characteristics

Characteristic	Details
Local context	The project is located approximately 185 kilometres north-east of Port Hedland, within the Shire of East Pilbara and Broome, in the extensive land use zone (GIS Database). The predominant land use in the region is grazing of native pastures, conservation and mining activity.
Ecological linkage and Conservation areas	According to available databases, the application area does not contain any known or mapped ecological linkages or conservation areas. The closest conservation area is the Eight Mile Beach Marine Park which is located approximately eight kilometres north of the northern section of the proposed access road (adjacent to the Great Northern Highway).
Vegetation description	The vegetation of the application area is broadly mapped as the following Beard vegetation associations (GIS Database): <ul style="list-style-type: none"> • 32 - Shrublands, pindan; acacia shrubland with eucalypt medium woodland over curley spinifex;

Characteristic	Details
	<ul style="list-style-type: none"> • 80 - Hummock grasslands, low tree steppe; desert walnut over soft spinifex between sand ridges; • 101 - Hummock grasslands, shrub steppe; Acacia pachycarpa over soft spinifex; • 117 - Hummock grasslands, grass steppe; soft spinifex; and • 134 - Mosaic: Hummock grasslands, open low tree steppe; desert bloodwood and feathertop spinifex on sandhills / Hummock grasslands, shrub steppe; mixed shrubs over spinifex between sandhills <p>It was recorded 20 vegetation types within the application area detailed on the vegetation analysis table (Preston, 2021).</p>
Vegetation condition	<p>The vegetation survey (Astron, 2019; Biota, 2020a) indicates the vegetation within the proposed clearing area is in excellent condition (Trudgen, 1988), described as:</p> <ul style="list-style-type: none"> • Excellent: Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement. <p>Some areas presented existing vehicle tracks, drill pads and an airstrip, hence those areas are degraded (Biota, 2020a).</p> <p>The full Trudgen (1998) condition rating scale is provided in Appendix D.</p>
Climate and landform	<p>The application area is mapped at the elevation of 580 to 600 metres AHD (GIS Database). The application area lies mostly within the Mackay (GSD02) and McLarty (GSD01) subregions of the Great Sandy Desert Interim Biogeographical Regionalisation of Australia (IBRA) bioregion, and a small portion within the Pindanland subregion (DAL02) of the Dampierland IBRA bioregion. The climate of each subregion is described below:</p> <ul style="list-style-type: none"> • Mackay (GSD02): The climate is arid tropical with summer rainfall and monsoonal influences apparent in the north-western sector of the region (Biota, 2020a). • McLarty (GSD01): The climate is arid tropical with summer rain and is influenced by monsoonal activity. Morning fogs are recorded during the dry season (Biota, 2020a). • Pindanland subregion (DAL02): The climate is dry hot tropical and semi-arid with summer rainfall. The average rainfall is between 450 - 700 millimetres, slightly lower than the Fitzroy Trough subregion (Biota, 2020a).
Soil description	<p>The soil is mapped in four soil units (Northcote, 1968):</p> <p>AB21: Pindan country - gently undulating sand plain with a few small rocky sandstone residuals; no external drainage: Chief soils are red earthy sands (Uc5.21), with associated (Uc5.11) and hummocks of siliceous sands (Uc1.23).</p> <p>AB22: Gently undulating sand plain as for unit AB21 but with many rocky sandstone residuals: chief soils are red earthy sands (Uc5.21), with (Uc5.11) and (Uc1.23) as for unit AB21. Associated are bare rock and shallow sands, probably Uc1.4, of the sandstone residuals.</p> <p>AB39: Gently undulating plains dominated by longitudinal dunes of varying frequency; some exposures of ironstone gravels on low rises occur in the dune swales: chief soils are red earthy sands (Uc5.21) on dune slopes, and inter-dune plains with red siliceous sands (Uc 1.23) on the dunes. Other soils include (KS-Uc5.21) on the gravelly rises where an ironstone (laterite) duricrust is present at about 45 cm depth; and (Um5.11) on small included areas of calcrete (kunkar).</p> <p>AB40: Gently undulating plain slightly more elevated than unit AB39, and dominated by longitudinal dunes, many exposures of ironstone gravels and some breakaways capped by ironstone (laterite) duricrust: chief soils are red earthy sands (Uc5.21), with red siliceous sands (Uc1.23) on the dunes. There is an increased amount of (KS-Uc5.21) soil compared with unit AB39, and locally it may become dominant.</p>
Land degradation risk	<p>The application area is located within four land systems with their respective percentage within the application area (Biota, 2020a; DPIRD, 2022; Preston, 2021):</p> <ul style="list-style-type: none"> • Buckshot (2%) Gravelly sandplains and occasional sand dunes supporting hard spinifex grasslands; • Callawa (14%) Highly dissected low hills, mesas and gravelly plains of sandstone and conglomerate supporting soft and hard spinifex grasslands; • Little Sandy (51%) Sandplains with linear and reticulate dunes supporting shrubby hard and soft spinifex grasslands; and • Nita (33%) Sandplains supporting shrubby spinifex grasslands with occasional trees.
Waterbodies	<p>The desktop assessment and aerial imagery indicate that no permanent watercourses or ephemeral drainages lines transect the area proposed to be cleared (Astron, 2019; GIS Database). The nearest river is located approximately 86 kilometres south-west of the application area (Astron, 2019). Eight Mile Beach is the nearest Ramsar wetland, located approximately 36 kilometres north of the project (GIS Database).</p>

Characteristic	Details
Hydrogeography	The application area is located within the Canning-Kimberley Groundwater Area proclaimed under the <i>Rights in Water and Irrigation Act 1914</i> . The mapped groundwater salinity is 500-1,000 milligrams per litre total dissolved solids which is described as marginal (GIS Database).
Flora	There are no records of Threatened flora within the application area. However, Biota (2021) compiled surveys completed in the application area and undertook a further survey, which resulted in six Priority species occurring within the application area.
Ecological communities	There are no mapped Threatened or Priority Ecological Communities (TEC/PEC) within the application area (Biota 2020a; GIS Database). The closest PEC are the Inland Mangroves community of salt creek (P1) and Mandora Land System (P3), located approximately 8 kilometres northeast of the proposed access road.
Fauna	A total of 144 vertebrate fauna species were recorded within the application area, including 17 of conservation significance (six ground-dwelling conservation significant fauna species and 11 migratory birds) (Biota, 2020b).

B.2. Vegetation analysis table

Vegetation types within the application area (Biota, 2021).

Table 9.2: Vegetation units of the WRAC.

NB. Bold sites were established by Biota during the 2019 WRAC survey and underlined sites were established by Biota during the 2020 WRAC survey.
 † denotes site established within the WPA.
 * denotes site established by Biota (2018a) during the AREH survey.
 ^ denotes relevé established by Astron (2019b) during the Paterson Road Corridor survey.

Broad Landform	Vegetation Code	Description	Sampling Sites Within or in Close Proximity to the WRAC	Extent in WRAC	
				Hectares	%
Sand Dunes and Associated Swales	D3	<i>Grevillea stenobotrya</i> , <i>G. wickhamii</i> , <i>Acacia anaticeps</i> tall open shrubland over <i>A. tumida</i> var. <i>kulpam</i> , <i>Cyanostegia cyanocalyx</i> , <i>Sida</i> sp. Western sand dunes (P.K. Latz 11980) open shrubland over <i>Dicrasyllis doranii</i> , (<i>Dampiera cinerea</i> , <i>A. stellaticeps</i> , <i>Gompholobium simplicifolium</i> , <i>Newcastelia cladotricha</i>) low open shrubland over <i>Triodia schinzii</i> very open hummock grassland and <i>Eriachne obtusa</i> , <i>Aristida holathera</i> var. <i>holathera</i> very open tussock grassland.	<u>WIN46</u> , <u>WINREL14</u> , AH23*, AH35*	253.1	1.80
	P1	<i>Owenia reticulata</i> , <i>Erythrophleum chlorostachys</i> scattered low trees over <i>Acacia platycarpa</i> open shrubland over <i>Jacksonia aculeata</i> , (<i>Androcalva loxophylla</i> , <i>Dicrasyllis cordifolia</i> , <i>Gompholobium simplicifolium</i> , <i>Seringia exastia</i>) low shrubland over <i>Triodia schinzii</i> open hummock grassland	WIN39	249.1	1.77
Inter-dunal Sand Plains	P2	<i>Owenia reticulata</i> , <i>Erythrophleum chlorostachys</i> scattered low trees over <i>Acacia ancistrocarpa</i> , (<i>Hakea macrocarpa</i>) tall shrubland over <i>Sorghum plumosum</i> var. <i>plumosum</i> , <i>Aristida holathera</i> var. <i>holathera</i> , <i>Amphipogon sericeus</i> scattered tussock grasses to very open tussock grassland over <i>Triodia schinzii</i> open hummock grassland	WIN35, WIN37	386.0	2.74
	P3	<i>Owenia reticulata</i> , <i>Erythrophleum chlorostachys</i> scattered low trees over <i>Acacia drepanocarpa</i> subsp. <i>latifolia</i> , (<i>A. platycarpa</i>) tall shrubland over <i>Jacksonia aculeata</i> low open shrubland over <i>Triodia schinzii</i> hummock grassland	WIN36	65.3	0.46
	P7	<i>Owenia reticulata</i> , <i>Erythrophleum chlorostachys</i> scattered low trees over <i>Acacia ancistrocarpa</i> low open shrubland over <i>Eulalia aurea</i> , (<i>Eriachne lanata</i>) very open tussock grassland over <i>Triodia epactia</i> open hummock grassland	<u>WIN45</u>	8.1	0.06
	P8	<i>Owenia reticulata</i> , <i>Erythrophleum chlorostachys</i> scattered low trees over <i>Acacia eriopoda</i> , <i>A. sericophylla</i> tall open shrubland over <i>Androcalva loxophylla</i> , <i>Dicrasyllis doranii</i> , <i>Jacksonia aculeata</i> low open shrubland over <i>Triodia schinzii</i> , (<i>T. epactia</i>) open hummock grassland.	<u>WIN40</u> , <u>WIN48</u> , <u>WIN51</u> , <u>WINRELO3</u> , <u>WINRELO6</u> , <u>WINRELO7</u> , <u>WINRELI2</u> , <u>WINRELI3</u> , <u>WINRELI5</u> , AH08*, AH30*, AH44 DR07^, DR08^	5,004.1	35.55
	P9	9.2.1.1 Erythrophleum chlorostachys scattered low trees over <i>Acacia ancistrocarpa</i>, <i>A. monticola</i> tall open shrubland over <i>Triodia schinzii</i>, (<i>T. epactia</i>) open hummock grassland.	WIN47, AH07*, AH12*, AH47*, DR23^, DR25^	688.7	4.89
Inter-dunal Sand Plains (continued)	P10	<i>Corymbia zygophylla</i> , <i>Erythrophleum chlorostachys</i> scattered low trees over <i>Grevillea eriostachya</i> , <i>G. wickhamii</i> scattered tall shrubs over <i>Gompholobium simplicifolium</i> , <i>Jacksonia aculeata</i> , (<i>Dicrasyllis doranii</i> , <i>Dampiera cinerea</i> , <i>Acacia stellaticeps</i>) low open shrubland over <i>Triodia schinzii</i> very open hummock grassland.	<u>WIN33</u> , <u>WIN34</u> , <u>WIN38</u> , <u>WIN49</u> , <u>WINREL17</u> , AH24*, AH28*, AH33*, AH34*, DR09^, DR14^, DR16^, DR22^, DR27^, DR29^	1,306.8	9.28
	P11	<i>Erythrophleum chlorostachys</i> scattered low trees over <i>Grevillea refracta</i> scattered tall shrubs over <i>Acacia ancistrocarpa</i> , <i>A. monticola</i> , <i>A. tumida</i> var. <i>kulpam</i> open shrubland over <i>Triodia epactia</i> open hummock grassland.	<u>WIN50</u> , <u>WINREL18</u> , AH48*, AH51*, AH52*, AH53*	1,943.0	13.80
	P12	<i>Grevillea refracta</i> , <i>Acacia monticola</i> , <i>A. colei</i> var. <i>colei</i> tall open shrubland over <i>A. hilliana</i> , <i>A. adoxa</i> var. <i>adoxo</i> scattered low shrubs over <i>Triodia epactia</i> open hummock grassland.	AH46*, AH49*	158.9	1.13
	P13	<i>Erythrophleum chlorostachys</i> , (<i>Owenia reticulata</i> , <i>Gardenia pyriformis</i> subsp. <i>keartlandii</i>) scattered low trees over <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> scattered tall shrubs over <i>Gompholobium simplicifolium</i> , <i>Jacksonia aculeata</i> low open shrubland over <i>Triodia schinzii</i> open hummock grassland.	DR01^, DR02^, DR05^, DR10^, DR11^, DR12^, DR13^, DR15^, DR17^, DR18^, DR19^, DR20^, DR21^, DR24^, DR26^	923.7	6.56
Stony Rises and Gentle Outcroppings	R3	<i>Acacia hilliana</i> , (<i>A. adoxa</i> var. <i>adoxo</i>) low open shrubland over <i>Triodia epactia</i> open hummock grassland.	<u>WINRELO4</u> , <u>WINRELO5</u> , <u>WINREL16</u> , AH05*, AH09*, AH10*, AH41*, AH42*, AH43*, AH45*, AH50*,	3,066.1	21.78
	R4	<i>Ficus brachypoda</i> low open woodland over <i>Acacia monticola</i> , <i>A. colei</i> var. <i>colei</i> , <i>Grevillea pyramidalis</i> tall open shrubland over <i>Triodia epactia</i> open hummock grassland.	AH56*, AH-REL01*	0.2	<0.01

Appendix C. 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> “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 contains habitats for a number of species of Priority flora.</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<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 habitats for conservation significant fauna.</p>	May be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<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>There are no known records of Threatened flora within the application area (GIS Database). A flora survey recorded <i>Seringia exastia</i> (T); however, this species is no longer of conservation significance as it has recently been classified as the same species as <i>Seringia elliptica</i>, which is common and widespread (Binks et al., 2020). The vegetation proposed to be cleared is not expected to support any species of Threatened flora (GIS Database).</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above</i>
<p><u>Principle (d):</u> “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><u>Assessment:</u></p> <p>There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the application area (GIS Database). The closest TEC is the Mandora Land System located approximately 26 kilometres east of the application area.</p>	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> “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><u>Assessment:</u></p> <p>The application area falls within the Great Sandy Desert and Dampierland IBRA bioregion (Biota, 2020a; GIS Database). The Beard vegetation associations within the application area are: 32, 80, 101, 117 and 134. Each vegetation association is described in Appendix B.1.</p> <p>According to the Government of Western Australia (2019), all of the vegetation systems associations retain approximately 99% of its pre-European extent at the state and bioregion level. In addition, the proposed project area only contains very small proportions of each of the current extents. The largest of these is Beard vegetation associated 117, with the proposed access road containing 1.2% of its current extent (Preston, 2021).</p>	Not likely to be at variance	No
<p><u>Principle (h):</u> “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.”</p> <p><u>Assessment:</u></p> <p>There are no conservation areas in the vicinity of the application area. The nearest DBCA managed land is the Eight Mile Beach Marine Park which is located approximately eight kilometres north of the northern section 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

Assessment against the clearing principles	Variance level	Is further consideration required?
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 permanent watercourses, wetlands or minor drainage lines within the area proposed to clear (GIS Database). Therefore, the proposed clearing is unlikely to impact vegetation growing in association with any 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></p> <p>The proposed clearing of up to 125 hectares of native vegetation, for the purpose of widening an existing access road is unlikely to cause appreciable land degradation. In addition, the absence of watercourse within the application area minimises the risks of erosion and, therefore, on land degradation as well.</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 Source Areas within or in close proximity to the application area nor permanent watercourses or wetlands within the area proposed to clear (GIS Database).</p> <p>Given the proposed project comprises areas previously degraded by existing access road, the proposed clearing for the purpose of widening the road is unlikely to impact surface or ground water quality (GIS Database).</p> <p>Based on the above, the proposed clearing is not likely to be at variance to this Principle.</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></p> <p>There are no permanent water courses or waterbodies within the application area (GIS Database). The proposed clearing of 125 hectares within a permit boundary of approximately 2,357.274 hectares spanning over 185 kilometres is not likely to cause an increase in the incidence or intensity of flooding in the local area.</p> <p>Therefore, the application area is unlikely to cause the incidence or intensity of flooding.</p>	Not likely to be at variance	No

Appendix D. 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:

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.

Condition	Description
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 E. Sources of information

E.1. GIS databases

Publicly available GIS Databases used (sourced from 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)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- 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 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)

E.2. References

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- Biota (2020d) Winu Project Subterranean Fauna Desktop Study and Verification Survey. Report prepared for Rio Tinto Winu Pty Limited, by Biota Environmental Sciences, January 2020.
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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.