



Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	9549/1
Permit type:	Purpose Permit
Applicant name:	Barto Gold Mining Pty Ltd
Application received:	31 December 2021
Application area:	55 hectares
Purpose of clearing:	Mineral production and associated activities
Method of clearing:	Mechanical Removal
Tenure:	Mining Leases 77/86, 77/380 Miscellaneous Licence 77/290
Location (LGA area/s):	Shire of Yilgarn
Colloquial name:	Lenneberg Project

1.2. Description of clearing activities

Barto Gold Mining Pty Ltd proposes to clear up to 55 hectares of native vegetation within a boundary of approximately 145.32 hectares, for the purpose of mineral production and associated activities. The project is located approximately 11 kilometres north of Marvel Loch, within the Shire of Yilgarn.

The application is to allow for the development of an open pit, associated Waste Rock Dump (WRD), the excavation of a cut-back to the existing Lenneberg open pit, and expansion of the existing WRD and supporting mining infrastructure. The proposed clearing will also allow the re-alignment of a short haul road to accommodate the north pit and allow access to transport ore to the Marvel Loch processing plant.

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	29 July 2022
Decision area:	55 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 31 December 2021. DMIRS advertised the application for a public comment for a period of 21 days, and one submission was received.

In making this decision, the Delegated Officer had regard for the direct interest party submissions, site characteristics (Appendix C), relevant datasets (Appendix I), 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 (Appendix D), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3).

The assessment identified that the proposed clearing may result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values;
- the loss of native vegetation that is suitable habitat for the Chuditch and Malleefowl, and potentially the Woma Python (southwest population), Lake Cronin Snake and Tree-stem Trapdoor Spider; and
- potential land degradation in the form of wind erosion.

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 managed by conditions and is not likely 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;
- commence construction no later than three months after undertaking clearing to reduce the risk of erosion;
- slow, progressive, one directional clearing to allow terrestrial fauna to disperse ahead of the clearing activity should they occur on site at the time of clearing; and
- undertake an inspection of areas to be cleared ahead of clearing activities to ensure that no Chuditch individuals or dens, or active Malleefowl mounds are present.

2. Legislative context

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

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

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

Other legislation of relevance for this assessment includes:

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

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values. Biological surveys (Stantec, 2021a) have identified several priority flora species clustered within the greater Survey Area and the original indicative mining footprint would have impacted populations of *Rinzia fimbriolata* (P1). The recording of these priority species resulted in the applicant implementing a number of proponent-led avoidance measures to avoid and minimise impacts to significant flora species. These measures included:

- Modification of the Project's infrastructure location and design to avoid all occurrences of *R. fimbriolata* and the associated 50 meter buffer so that no direct impacts will occur.
- The proponent will take additional measures to avoid impacts to *R. fimbriolata* through dust management and minimisation.
- The southwestern boundary of the proposed Purpose Permit Area has been adjusted to minimise the interactions with *Stenanthemum bremerense* (P4) population associated with a stony rise feature in the landscape (Stantec, 2021a).

3.2. Assessment of impacts on environmental values

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

The assessment against the clearing principles identified that the impacts of the proposed clearing present a risk to biological values (flora, vegetation and fauna) and land resources. 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, vegetation) - Clearing Principle (a)

Assessment

Priority flora

Stantec (2021b) recorded a total of 77 vascular flora taxa, representing 24 families and 41 genera within the application area. No Threatened or Priority Flora were recorded within the application area. Based on habitat availability, eight Priority flora species may occur within the application area (Stantec, 2021b). There were two priority flora species, *Rinzia fimbriolata* (Priority 1) and *Stenanthemum bremerense* (Priority 4) recorded in close proximity outside the application area (Stantec, 2021b).

Although suitable habitat occurs within the application area for *Goodenia heatheriana* (Priority 1) and *Styloidium choreanthum* (Priority 3), the survey was undertaken during the known flowering period for these species and was not recorded within the application area (Stantec, 2021b).

The survey was undertaken outside the flowering periods for *Acacia concolorans* (Priority 2), *Notisia intonsa* (Priority 3) *Phlegmatospermum eremaum* (Priority 3) and *Teucrium diabolicum* (Priority 3), which may occur within the application area (Stantec, 2021b). The species *P. eremaum* and *N. intonsa* have wide distribution across several IBRA regions, with several locations within conservation reserves (Western Australian Herbarium, 1998-). The species *A. concolorans* and *T. diabolicum* have a relatively wide distribution, however no recorded locations are within conservation reserves (Western Australian Herbarium, 1998-). If undetected within the application area, based on the above, the proposed clearing would unlikely impact the conservation status of these species.

Floristic diversity and composition were considered typical of the Southern Cross subregion and showed similarities to the nearby Avon Wheatbelt 1 subregion (Stantec, 2021b).

Priority Ecological Community

According to available databases, the buffer of the Priority 3 Parker Range vegetation complexes Ecological Community (PEC) is located approximately 7 kilometres from the application area (GIS Database). However, Stantec (2021) consider the vegetation type EIEsuMpAv to be analogous with Community 2 of the PEC, and vegetation type EIEsEsuMpEiiSaOm to be analogous with Community 3 of the PEC. Approximately 104.04 ha of vegetation type EIEsuMpAv occurs within the application area, whereas 5.41ha of vegetation type EIEsEsuMpEiiSaOm occurs within the application area (Stantec, 2021).

Barto Gold (2022) have advised that approximately 34 hectares of the EIEsuMpAv vegetation type and 1.5 hectares of the EIEsEsuMpEiiSaOm vegetation type will be impacted by the proposed clearing. The proposed clearing is unlikely to increase the conservation significance of this PEC, however cumulative impact to this PEC should be further considered in any future clearing proposals.

There are numerous species of weed present the application area. Clearing activities should be undertaken in a manner that reduces the risk of further spreading weeds to the surrounding areas.

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on Priority Ecological Communities and habitat for Priority flora is not likely to be significant. There are weeds 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 habitat) – Clearing Principle (b)

Field fauna surveys were undertaken by Stantec (2021b) in April and September 2020 over the application area and surrounding area, and motion sensing cameras were deployed for 29 nights between June and July 2021.

One broad faunal habitat type was identified within the application area, which was identified as important to numerous conservation significant species (Stantec, 2021b): *Eucalyptus* woodlands – *Eucalyptus salmonophloia*, *Eucalyptus salubris* and *Eucalyptus loxophleba* subsp. *lissophloia* over *Melaleuca* spp. tall shrubland over low open shrubland. The habitat ranged from relatively open areas dominated by mature tall Eucalypts to densely vegetated areas with immature Eucalypts, regenerating after fire. Mallee forms of the Eucalypts also occurred within the Eucalypt Woodland habitat.

The large hollow bearing trees provide important habitat for the Western Rosella (*Platycercus icterotis xanthogenys*) (inland pop.) (P4). The thick vegetation at some sites may also serve as suitable foraging habitat for the Western Rosella and the Peregrine Falcon (*Falco peregrinus*) (OS) within this habitat type. Given the highly mobile nature of these species and the large tracts of uncleared vegetation outside the application area which contains eucalypt woodlands and shrublands (GIS Database), the proposed clearing is not likely to represent significant habitat for these species.

The large woody debris and logs present in the Eucalyptus Woodlands habitat may provide denning habitat for the Chuditch (*Dasyurus geoffroi*) (VU). The motion sensing cameras identified Chuditch utilising the *Eucalyptus* woodland habitat within the application area (Stantec, 2021c). The application area is considered to comprise of important habitat for the Chuditch, with the application area possibly being utilised for both foraging and sheltering purposes. Potential impacts to Chuditch as a result of the proposed clearing may be minimised by the implementation of a fauna management condition. This will require a pre-clearing inspection for dens, relocation of individuals occupying identified dens, and replacement/relocation of confirmed dens in adjoining habitat.

The Western Brush Wallaby (*Notamacropus irma*) (Priority 4) was recorded on a motion camera outside the application area, within the local shrubland habitat (Stantec, 2021c). Given that this species prefers a more open shrubland habitat type, the proposed clearing is not likely to impact the conservation status of this species.

No evidence of Malleefowl was identified within the application area, however both active and inactive mounds have been recorded in the local area (Stantec, 2021b). The application area contains suitable dense shrub cover and leaf litter on substrates suitable for mound building, which occurs within the application area. Potential impacts to Malleefowl as a result of the proposed clearing may be minimised by the implementation of a fauna management condition. This will require a pre-clearing inspection for mounds during the breeding season, and the avoidance of any active mounds.

The Woma Python (southwest population) (*Aspidites ramsayi*) (P1), Lake Cronin Snake (*Paroplocephalus atriceps*) (P3) and Tree-stem Trapdoor Spider (*Aganippe castellum*) (P4) were identified as potentially utilising the application area, based on species range and suitability of habitat within the application area. Potential impacts to these species as a result of the proposed clearing may be minimised by a fauna management condition, which requires clearing to be undertaken in a slow progressive manner to allow fauna to escape.

Conclusion

Based on the above assessment, the proposed clearing will result in some loss of habitat for conservation significant fauna species. Individuals may be impacted by the proposed clearing however, the impact to fauna may be minimised by the implementation of conditions on the permit.

Conditions

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

- directional clearing, which requires slow, progressive, one directional clearing to allow terrestrial fauna to disperse ahead of the clearing activity should they occur on site at the time of clearing;
- a pre-clearance survey for Malleefowl mounds, where areas proposed to be cleared during the Malleefowl breeding season must be inspected to identify any active Malleefowl mounds, and where mounds have been identified, no clearing occurs within 50 metres of the mound;
- a pre-clearance survey for Chuditch individuals and dens, and where individuals or dens have been identified, either relocated into adjacent suitable habitat, or replacement dens are installed in adjacent suitable habitat.

3.2.3. Land resources – Clearing Principle (g)

Assessment

The Greenmount system consists of gently undulating rises to rolling low hills in the eastern Zone of Ancient Drainage. Soils are loamy earths (mostly red, calcareous and clayey and stony), supporting Eucalypt woodlands (Pringle et al, 1994).

The application area occurs in an area that has been mapped as a high risk of wind erosion (DPIRD, 2022). The proposed clearing of up to 55 hectares of native vegetation within a boundary of approximately 145.3 hectares, for the purpose of mineral production may cause land degradation.

Conclusion

Based on the above assessment, the proposed clearing may cause land degradation in the form of wind erosion.

Conditions

To address the above impacts, the following management measure will be required as a condition on the clearing permit:

- Staged clearing which requires that areas are utilised within three months of clearing being undertaken.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 9 February 2022 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. One submission was received in relation to this application (see Appendix B).

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

There are no registered Aboriginal Sites of Significance within the application area (DPLH, 2022). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

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
The applicant provided a Targeted Chuditch Survey Report and the Lenneberg Flora, Vegetation and Fauna Survey associated with the application area.	These surveys were reviewed and used to inform the assessment of potential impacts to conservation significant flora, fauna and vegetation communities.

Appendix B. Details of public submissions

Summary of comments	Consideration of comment
The Shire of Yilgarn provided a submission objecting to the proposed clearing, as the council has concerns regarding current rehabilitation at other Barto Gold Mining Pty Ltd sites.	<p>This request was passed on to the applicant and they were encouraged to liaise with the Shire of Yilgarn to address rehabilitation concerns.</p> <p>A rehabilitation condition has not been placed on the permit. The application is located on <i>Mining Act 1978</i> tenure which requires the approval and adherence to a mine closure plan. Given the longer term nature of the proposed activities, it is considered appropriate that the rehabilitation and closure of the site is managed under approvals of the <i>Mining Act 1978</i>. This is the case for other Barto Gold Mining Pty Ltd permits which are located on <i>Mining Act 1978</i> tenure.</p>

Appendix C. Site characteristics

C.1. Site characteristics

Characteristic	Details
Local context	The project is located approximately 11 kilometres north of Marvel Loch. The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia.
Ecological linkage	According to available databases, there are no formal ecological linkages mapped over the application area.
Conservation areas	The closest conservation area is the Yellowdine Nature Reserve, located approximately 17 kilometres east of the application area.
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation association 1068: Medium woodland; salmon gum, morrel, gimlet & <i>Eucalyptus sheathiana</i> (GIS Database).</p> <p>A flora, vegetation and fauna survey was conducted over the application area and surrounding area by Stantec on 1 October 2020 and 21 - 22 March 2021. The following vegetation associations were recorded within the application area (Stantec, 2021):</p> <p>EIEsEsuMpEiiSaOm - <i>Eucalyptus longicornis</i> and <i>Eucalyptus salmonophloia</i> and <i>Eucalyptus salubris</i> open forest over <i>Melaleuca pauperiflora</i> and <i>Eremophila interstans</i> subsp. <i>interstans</i> tall open shrubland over <i>Santalum acuminatum</i> scattered shrubs over <i>Olearia muelleri</i> scattered herbs.</p> <p>EIEsp.EyMpTcOm - <i>Eucalyptus longicornis</i>, <i>Eucalyptus</i> sp. <i>Eucalyptus yilgarnensis</i> open forest over <i>Melaleuca pauperifolia</i> and <i>Templetonia ceracea</i> open shrubland over <i>Olearia muelleri</i> scattered herbs.</p> <p>EIEsuMpAv – <i>Eucalyptus longicornis</i>, <i>Eucalyptus salubris</i> woodland over <i>Melaleuca pauperifolia</i> tall shrubland over <i>Atriplex vesicaria</i> low open shrubland.</p> <p>EIIAcMhAaBssDb – <i>Eucalyptus loxophleba</i> subsp. <i>lissophloia</i> woodland over <i>Allocasuarina campestris</i> and <i>Melaleuca hamata</i> and <i>Acacia acuminata</i> tall open shrubland over <i>Beyeria sulcata</i> var. <i>sulcata</i> and <i>Dodonaea bursariifolia</i> open shrubland.</p>

Characteristic	Details
Vegetation condition	The vegetation survey (Stantec, 2021) indicates the vegetation within the proposed clearing area is in excellent to completely degraded (Keighery, 1994) condition. The full Keighery (1994) condition rating scale is provided in Appendix E.
Climate and landform	The application area is mapped within elevations of 410-420 metres AHD. The annual average rainfall (Southern Cross Airfield) is 301.3 millimetres (BoM, 2022).
Soil description	The soil is mapped as 261Gr_2: Loamy earth (mostly calcareous) and clay, and 261Gr_3l: Loamy lateritic earths (DPIRD, 2022).
Land degradation risk	The application area has been mapped as high risk of wind erosion (DPIRD, 2022).
Waterbodies	No permanent watercourses or waterbodies have been mapped within the application area (GIS Database).
Hydrogeography	The application area is not within any Public Drinking Water Source Area. The mapped groundwater salinity is 14,000-35,000 milligrams per litre total dissolved solids which is described as saline.
Flora	No Threatened or Priority flora species were recorded within application area, however six locations of <i>Rinzia fimbriolata</i> (Priority 1) and 12 locations of <i>Stenanthemum bremerense</i> (Priority 4) were recorded approximately 50 metres outside the permit boundary (Stantec, 2021b).
Ecological communities	There are no mapped Threatened Ecological Communities (TECs) within or in close proximity to the application area. The buffer of the Priority 3 Parker Range vegetation complexes Ecological Community is located approximately 7 kilometres from the application area (GIS Database).
Fauna	According to available datasets and fauna surveys in the area, there are records of four conservation listed fauna species within the local area. A likelihood of analysis identified seven species that may occur within the application area based on habitat suitability, as presented in section C.4. below.

C.2. Vegetation extent

	Pre-European area (ha)	Current extent (ha)	Extent Remaining %	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA Managed Lands
IBRA Bioregion - Coolgardie	12,912,204	12,648,491	~97.96	2,114,349	16.39
Beard vegetation associations - State					
1068	268,900	142,088	~52.84	16,761	6.24
Beard vegetation associations - Bioregion					
1068	193,988	104,804	~54.03	14,154	7.31

Government of Western Australia (2019)

C.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix I.1), and biological survey information, impacts to the conservation significant flora in Appendix G required further consideration.

C.4. Fauna analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix I.1), and biological survey information, impacts to the conservation significant fauna in Appendix H required further consideration.

Appendix D. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared may contain habitat for conservation significant flora species and a Priority Ecological Community (Priority 3).</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contains foraging habitat for conservation significant fauna. Nearby records of Western Rosella, Peregrine Falcon, Malleefowl and Chuditch indicate that these species will utilise the application area.</p>	At variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared is unlikely to contain habitat for flora species listed under the BC Act.</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.”</i></p> <p><u>Assessment:</u></p> <p>The proposed clearing area does not contain species representative of a TEC listed under the BC Act or EPBC Act.</p>	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The application area falls within the Coolgardie Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 97% of the pre-European vegetation still exists in the IBRA Coolgardie Bioregion (Government of Western Australia, 2019). The application area is broadly mapped as Beard vegetation association Yilgarn 1068: Medium woodland; salmon gum, morrel, gimlet & <i>Eucalyptus sheathiana</i> (GIS Database). Approximately 52% and 54% of the pre-European extent of this vegetation association remains uncleared at the state and bioregional level, respectively (Government of Western Australia, 2019).</p> <p>Whilst the land to the west and east of the application area has been extensively cleared for agriculture, the vegetated tract of land the application area occurs within is not part of a significant ecological linkage within the landscape, nor is it required to maintain ecosystem services or ecological values within the landscape. Therefore, the application area does not represent a significant remnant of native vegetation in an area that has been extensively cleared.</p>	May be at variance	No
<p><u>Principle (h):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Assessment:</u></p> <p>Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of any conservation areas.</p>		
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 watercourses or wetlands within the application area. There is no mapped riparian vegetation within the application area (Stantec, 2021).</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 mapped soil types within the application area indicate that there are some areas of the application area which have an inherently high risk of erosion (DPIRD, 2022). Leaving large areas of clearing open also increases the risk of land degradation.</p>	At variance	Yes <i>Refer to Section 3.2.3, above</i>
<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 (GIS Database). There are no permanent watercourses or wetlands within the application area (GIS Database). The proposed clearing is unlikely to impact surface or ground water quality.</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 watercourses or waterbodies within the application area (GIS Database). Seasonal drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events. However, the proposed clearing is unlikely to increase the incidence or intensity of natural flooding events.</p>	Not likely to be at variance	No

Appendix E. Vegetation condition rating scale

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



Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.



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

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.

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

Appendix F. Biological survey information excerpts

Vegetation type code	Vegetation type description	Sample sites	Extent within Survey Area		Extent within the Proposed Permit Area		Representative photograph
			Hectares (ha)	Proportion (%)	Hectares (ha)	Proportion (%)	
EIEsEsuMpEi iSaOm	<p><i>Eucalyptus longicornis</i> and <i>Eucalyptus salmonophloia</i> and <i>Eucalyptus salubris</i> open forest over <i>Melaleuca pauperiflora</i> and <i>Eremophila interstans</i> subsp. <i>interstans</i> tall open shrubland over <i>Santalum acuminatum</i> scattered shrubs over <i>Olearia muelleri</i> scattered herbs</p> <p><u>Associated species:</u> <i>Acacia erinacea</i>, <i>Acacia merrallii</i>, <i>Atriplex vesicaria</i>, <i>Austrostipa elegantissima</i>, <i>Dodonaea stenozyga</i>, <i>Eremophila scoparia</i>, <i>Maireana carnosae</i>, <i>Philotus holosericeus</i>, <i>Sclerolaena diacantha</i>, <i>Senna artemisioides</i> subsp. <i>filifolia</i> and <i>Templetonia ceracea</i></p>	QLOM70 QLEN02 RLEN01	27.29	10.37	5.41	3.72	
EIEsp.EyMp TcOm	<p><i>Eucalyptus longicornis</i>, <i>Eucalyptus</i> sp. <i>Eucalyptus yilgarnensis</i> open forest over <i>Melaleuca pauperifolia</i> and <i>Templetonia ceracea</i> open shrubland over <i>Olearia muelleri</i> scattered herbs</p> <p><u>Associated species:</u> <i>Acacia merrallii</i>, <i>Atriplex vesicaria</i>, <i>Eremophila ionantha</i>, <i>Eremophila scoparia</i>, <i>Eucalyptus calycogona</i>, <i>Eucalyptus salubris</i>, <i>Maireana trichoptera</i>, <i>Microcybe multiflora</i>, <i>Philotus exaltatus</i>, <i>Sclerolaena diacantha</i>, <i>Sclerolaena drummondii</i></p>	QLEN04	6.16	2.34	0.3	0.21	

Vegetation type code	Vegetation type description	Sample sites	Extent within Survey Area		Extent within the Proposed Permit Area		Representative photograph
			Hectares (ha)	Proportion (%)	Hectares (ha)	Proportion (%)	
EIEsuMpAv	<p><i>Eucalyptus longicornis</i>, <i>Eucalyptus salubris</i> woodland over <i>Melaleuca pauperifolia</i> tall shrubland over <i>Atriplex vesicaria</i> low open shrubland</p> <p><u>Associated species:</u></p> <p><i>Acacia erinacea</i>, <i>Acacia merrallii</i>, <i>Austrostipa elegantissima</i>, <i>Dodonaea stenozyga</i>, <i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i>, <i>Eremophila scoparia</i>, <i>Eucalyptus salmonophloia</i>, <i>Exocarpos aphyllus</i>, <i>Maireana trichoptera</i>, <i>Olearia muelleri</i>, <i>Santalum acuminatum</i>, <i>Sclerolaena diacantha</i>, <i>Templetonia ceracea</i></p>	QLOM68 QLOM72 QLOM73 QLEN01	178.45	67.85	104.04	71.57	
EIIAcMhAa BssDb	<p><i>Eucalyptus loxophleba</i> subsp. <i>lissophloia</i> woodland over <i>Allocasuarina campestris</i> and <i>Melaleuca hamata</i> and <i>Acacia acuminata</i> tall open shrubland over <i>Beyeria sulcata</i> var. <i>sulcata</i> and <i>Dodonaea bursariifolia</i> open shrubland.</p> <p><u>Associated species:</u></p> <p><i>Austrostipa elegantissima</i>, <i>Dodonaea bursariifolia</i>, <i>Grevillea obliquistigma</i> subsp. <i>obliquistigma</i>, <i>Olearia muelleri</i>, <i>Phebalium tuberculosum</i>, <i>Prostanthera semiteres</i> subsp. <i>semiteres</i>, <i>Stenanthemum bremerense</i> (F4), <i>Thysanotus manglesianus</i>, <i>Trymalium myrtilloides</i>, <i>Waitzia acuminata</i></p>	QLEN03 QLOM69 QLOM71 LOMR02	21.49	8.17	7.25	4.98	
Cleared	Cleared		29.63	11.26	28.16	19.37	

Appendix G. Flora analysis table

Species name	Conservation code		Broad habitat	Flowering period	Nearest known location (km)	Database/s Survey Report	Likelihood of occurrence within the Survey Area	
	EPBC Act	BC Act					Pre-survey	Post-survey
<i>Acacia lobulata</i>	En	T	Gritty loam or sand. Low granitic breakaways.	July	84	PMST	Unlikely: The Survey Area is located well outside of the range of this species.	Unlikely: The Survey Area is located well outside of the range of this species.
<i>Dasymalla axillaris</i>	Cr	T	Sand plains (yellow sand).	July, September, October, November or December	265	PMST	Unlikely: The Survey Area is located well outside of the range of this species.	Unlikely: The Survey Area is located well outside of the range of this species.
<i>Daviesia microcarpa</i>	En	T	Red/brown sand, clay, loam, often near disturbance.	September to December	19.00	WAHerb TPFL Stantec	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Eremophila virens</i>	En	T	Red/brown sand. Granite hillsides.	August to October	92	PMST	Unlikely: The Survey Area is located well outside of the range of this species.	Unlikely: The Survey Area is located well outside of the range of this species.

<i>Eremophila viscida</i>	En	T	Granitic soils, sandy loam. Stony gullies, sandplains.	September to November	73	PMST	Unlikely: The Survey Area is located well outside of the range of this species.	Unlikely: The Survey Area is located well outside of the range of this species.
<i>Gastrolobium graniticum</i>	En	T	Sand, sandy loam, granite. Margins of rock outcrops, along drainage lines.	August to September	37	PMST	Unlikely: The Survey Area is located well outside of the range of this species.	Unlikely: The Survey Area is located well outside of the range of this species.
<i>Isopogon robustus</i>	Cr	T	Skeletal grey sandy loam, laterite. Ridges.	October	30	PMST WAHerb TPFL Gibson and Lyons (1998)	Unlikely: The Survey Area is located outside of the range of this species.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Philotheca falcata</i>	En	T	Flat. Dry, orange /brown loam-clay.	October	19.76	WAHerb	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.

<i>Ricinocarpos brevis</i>	En	T	Rocky hillslopes, rock outcrops.	June to July	150	PMST	Unlikely: The Survey Area is located well outside of the range of this species.	Unlikely: The Survey Area is located well outside of the range of this species.
<i>Symonanthus bancroftii</i>	En	T	White / grey coarse sandy clay. Moist, ephemeral wetland areas.	September	94	PMST	Unlikely: The Survey Area is located well outside of the range of this species.	Unlikely: The Survey Area is located well outside of the range of this species.
<i>Eucalyptus crucis</i> subsp. <i>crucis</i>	VU	T	Sand, loam. Granite outcrops.	October or December or January to March	20.68	WAHerb Naturemap	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain suitable habitat. If present in the Survey Area, it is likely that this perennial malee with distinctive 'minni-ritchi' bark would have been detectable at the time of the survey.
<i>Cryptandra exserta</i>		P1	Sandy soil with laterite gravel, red sand over clay. Gentle mid-slopes, plains.	July	7.54	Stantec (2019)	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.

<i>Goodenia heatheriana</i>		P1	Red crumbly clay, greenstone gravel and cobbles. Lower slopes, moderately exposed gently undulating plain, roadsides.	September to October	6.02	WAHerb NatureMap Recon Environmental (2008a)	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat.	Possible: The Survey Area is within the range of this species and does contain suitable habitat. If present in the Survey Area, this low (0.15m) annual herb, which may have been flowering at the time of survey, may not have been detectable.
<i>Grevillea lissopleura</i>		P1	Stony loam on banded ironstone. On ridges.	August	17.21	WAHerb NatureMap	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Grevillea phillipsiana</i>		P1	Red sand, stony loam, Granite hills.	July to September	29	Gibson and Lyons (1998)	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
								detectable at the time of the survey.
<i>Hemigenia</i> sp. Newdegate (E. Bishop 75)		P1	Clay loam. Disturbed sites.	September to October	6.23	WAHerb NatureMap Botanica (2016b) (MWH 2014b) McCune <i>et al.</i> (2002)	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat.	Unlikely: The Survey Area is within the range of this species and does contain suitable habitat. If present in the Survey Area, this perennial shrub would have been detectable at the time of the survey.
<i>Hemigenia obovata</i>		P1	White or black wet sand. Flats and wetlands.	October to November	Not available	Gibson and Lyons (1998)	Unlikely: Although this species has been recorded by a previous survey within proximity to the Survey Area, only two records are held by the WAH for this species, both of which are located west of Mount Barker, some 400 km away.	Unlikely: The Survey Area does not occur within the range of this species and does not contain suitable habitat.
<i>Hydrocotyle corynophora</i>		P1	Creek bed to shallow depression, red-brown cracking clay loam.	October	5.48	WAHerb NatureMap	Possible: This species has been recorded in close proximity to the Survey Area, however, the Survey	Unlikely: The Survey Area does not contain suitable habitat for this species.

							Area is unlikely to contain suitable habitat for this species.	
<i>Hysterobaeckea ochropetala</i> subsp. <i>ochropetala</i>		P1	Orange brown gravelly sandy loam. Slope, Yellow clay loam. Flat, Brown clay loam. Sandy plain.	September to November	26.40	Stantec (2019)	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is located well outside of the range of this species and if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Lepidosperma</i> sp. Mt Caudan (N. Gibson & M. Lyons 2081)		P1	Slopes, ironstone/laterite gravel, brown/orange sandy loam.	No available information	20.29	Stantec (2019)	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this tufted sedge would have been detectable at the time of the survey.
<i>Leucopogon</i> sp. Yellowdine (M. Hislop & F. Hort MH 3194)		P1	Slopes/undulating sandplain, yellow sand.	January, February or May	11.96	WAHerb NatureMap	Possible: This species has been recorded in close proximity to the Survey Area and the Survey Area may contain suitable habitat, although it has been recorded	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would

							infrequently in the area.	have been detectable at the time of the survey.
<i>Millotia newbeyi</i>		P1	Red/brown loam, red clay. Undulating plains.	September	8.96	WAHerb NatureMap	Possible: This species has been recorded in close proximity to the Survey Area and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Phebalium</i> sp. Mt Gibbs		P1	Grey/yellow/brown loamy sand with scattered pea gravel	June to August	13.07	Stantec	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Rinzia fimbriolata</i>		P1	Well drained soil, Brown sandy loam. Clay with quartz.	September	2.1	Stantec (2019) Stantec	Likely: The species has been recorded in close proximity to the Survey area and the Survey area may contain	Confirmed: This species was recorded in the Survey Area.
<i>Verticordia elizabethiae</i>		P1	Sandy soils, lake shores.	November	18.60	WAHerb Naturemap	Unlikely: The survey area is within the	Unlikely: The Survey Area does not

							distribution range of the species. The Survey Area is unlikely to contain suitable habitat for this species.	contain suitable habitat.
<i>Acacia asepala</i>		P2	Red-brown sandy loam. Undulating plains, along drainage lines.	August	8.44	WAHerb TPFL Naturemap Stantec	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Acacia concolorans</i>		P2	Red/brown loam, clay. Low lateritic hills, flats.	July to August	3.99	WAHerb NatureMap Stantec Recon Environmental (2008a) Gibson and Lyons (1998)	Likely: The species has been recorded in close proximity to the Survey area and the Survey area may contain suitable habitat.	Possible: The Survey Area is within the range of this species and does contain some suitable habitat. If present in the Survey Area this species may have gone undetected due to the small (0.1 – 0.5 m) and sometimes compact habit of this species, in conjunction with the survey being conducted outside of the known flowering period.
<i>Lissanthe scabra</i>		P2	Dry, white to orange-brown clay, sandy gravel loams, granite. Breakaways, uplands.	August	17.34	WAHerb Naturemap TPFL	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species however it does not contain suitable habitat. In addition, if this species was present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Verticordia dasystylis</i> subsp. <i>dasystylis</i>		P2	Pale orange, granitic sandy loam	April or November	19.59	WAHerb TPLF	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Verticordia multiflora</i> subsp. <i>solox</i>		P2	Yellow sand over gravel, sand over granite.	October to December or January	8.04	WAHerb NatureMap	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been

								detectable at the time of the survey.
<i>Acacia ancistrophylla</i> var. <i>perarcuata</i>		P3	Red sand, clay loam, loam. Undulating plains.	August to September	11.73	WAHerb Naturemap	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Acacia crenulata</i>		P3	Clay, sandy clay, yellow sand. Rocky rises, granite outcrops, breakaways.	March to May, October	9.92	WAHerb TPFL NatureMap Recon Environmental (2008b)	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species however it does not contain suitable habitat. In addition, it is likely that, if present in the Survey Area, this perennial shrub/tree would have been detectable at the time of the survey.
<i>Acacia dissona</i> var. <i>indoloria</i>		P3	Sand, sandy loam. Undulating plains.	August to September	17.59	Stantec (2019) Recon Environmental (2008a) Recon Environmental (2008b)	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been

							infrequently in the area.	detectable at the time of the survey.
<i>Acacia desertorum</i> var. <i>nudipes</i>		P3	Yellow sand, lateritic gravel. Sandplains, flats.	August to October	6.88	WAHerb TPFL NatureMap	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey. The survey was also conducted during the known flowering period for this species.
<i>Acacia filifolia</i>		P3	Yellow sand, gravelly lateritic sand. Sandplains.	May to September	12.82	WAHerb TPFL NatureMap	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Baeckea grandibracteata</i> subsp. Parker Range (K. Newbey 9270)		P3	Mid slopes to sandplain, yellow silty sand to sandy loam.	November	6.87	WAHerb NatureMap	Possible: The Survey Area is within the distribution range of this species and the Survey Area may	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat,

							contain suitable habitat, although it has been recorded infrequently in the area.	however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Cryptandra crispula</i>		P3	Brown sandy clay, yellow loamy sand, red soil, pebbles. Dune ridges, hills, near salt lakes.	July, August, September	10.06	WAHerb NatureMap	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species but does not contain suitable habitat.
<i>Eutaxia rubricarina</i>		P3	Gravelly sand, grey to pinkish-white sandy clay, red loam. Flats, slopes, valley floors, road verges.	August or October	19.76	WAHerb	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Hakea pendens</i>		P3	Stony loam, ironstone ridges.	September	3.19	WAHerb TPFL NatureMap Stantec	Likely: The species has been recorded in close proximity to the Survey area and the Survey area may	Unlikely: The Survey Area is within the range of this species but does not contain suitable habitat.

						Recon Environmental (2008b) Recon Environmental (2008a) Mattiske Consulting (2001) Gibson and Lyons (1998)	contain suitable habitat.	
<i>Notisia intonsa</i>		P3	Plain to floodplain, red to brown clay to clay loam.	September, October, November	6.08	WAHerb NatureMap Gibson and Lyons (1998)	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Possible: The Survey Area is within the range of this species and does contain some suitable habitat. If present in the Survey Area, this annual herb may have been undetected at the time of survey, which occurred outside of its flowering time.
<i>Philothea coateana</i>		P3	Red sand	August to September	21.20	Recon Environmental (2008a)	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.

<i>Phlegmatospermum ermaeum</i>		P3	Stony loam.	June or August to October	6.48	WAHerb Naturemap	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Possible: The Survey Area is within the range of this species and does contain some suitable habitat. If present in the Survey Area, this annual herb may have been undetected at the time of survey, which occurred outside of its flowering time.
<i>Prostanthera nanophylla</i>		P3	Yellow sand over laterite, rocky loam. Sandplains.	August to November	11.92	WAHerb Naturemap	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Stenanthemum poicilum</i>		P3	Red clay or sandy clay, loam	September to November	21.18	Recon Environmental (2008a)	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been

								detectable at the time of the survey.
<i>Stylidium choreanthum</i>		P3	White/yellow or red sand. Plains.	September to November	11.66	WAHerb TPFL Naturemap	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Possible: The Survey Area is within the range of this species and does contain some suitable habitat. Despite the survey taking place within the known flowering period, this inconspicuous herb (0.01-0.03 m), if present in the Survey Area, may have been undetected at the time of survey.
<i>Teucrium diabolicum</i>		P3	<i>Eucalyptus</i> low woodlands, low undulating plains, shallow depressions, Brown sandy clay loam, crumbling red loamy clay	March to early May and Late October to mid-November	5.20	WAHerb NatureMap	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Possible: The Survey Area is within the range of this species and does contain some suitable habitat. If present in the Survey Area, this inconspicuous perennial sub-shrub (0.1 – 0.2 m) may have been undetected at the time of survey, which occurred outside of its flowering time.
<i>Verticordia mitodes</i>		P3	Yellow sand. Undulating plains	October to December or January	10.67	WAHerb NatureMap	Possible: The Survey Area is within the distribution range of this species and the	Unlikely: The Survey Area is within the range of this species and does contain

							Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Verticordia stenopetala</i>		P3	Yellow sand, sometimes with gravel. Undulating plains	October to December or January	8.04	WAHerb TPFL NatureMap	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Banksia shanklandiorum</i>		P4	White/yellow sand with lateritic gravel. Flats, disturbed sites.	June to August	22.55	Stantec (2019)	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Calamphoreus inflatus</i>		P4	Clay loam with ironstone gravel. Flats, disturbed sites.	October to December or February to March	14.62	TPFL WAHerb NatureMap	Possible: The Survey Area is within the distribution range of this species and the	Unlikely: The Survey Area is within the range of this species and does contain

						Recon Environmental (2008a) MWH (2014b)	Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Eremophila caerulea</i> subsp. <i>merrallii</i>		P4	Sand, clay or loam. Undulating plains.	October to December	8.44	WAHerb NatureMap Recon Environmental (2008a) Recon Environmental (2007)	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Eremophila racemosa</i>		P4	Sandy or stony loam, clay loam. Undulating plains, roadsides.	March or August to December	Not available	Mattiske Consulting (2001)	Possible: This species has been recorded by a previous survey within proximity to the Survey Area and may contain suitable habitat.	Unlikely: The Survey Area does contain suitable habitat. However if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey which coincided with its flowering period.
<i>Grevillea neodissecta</i>		P4	Lateritic gravel to ironstone, red to yellow loamy sand.	January, February, September, October,	22.21	Stantec (2019)	Possible: The Survey Area is within the distribution range of this species and the	Unlikely: The Survey Area is within the range of this species and does contain

				November December			Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Microcorys Forrestania</i> sp.		P4	Yellow sandy clay or red-brown clay. Open woodland or cleared areas.	January or April	18.51	WAHerb NatureMap	Possible: The Survey Area is within the distribution range of this species and the Survey Area may contain suitable habitat, although it has been recorded infrequently in the area.	Unlikely: The Survey Area is within the range of this species and does contain some suitable habitat, however if present in the Survey Area, it is likely that this perennial shrub would have been detectable at the time of the survey.
<i>Stenanthemum bremerense</i>		P4	Orange-brown sandy loam, skeletal red loam, orange-red gravelly loam, laterite, ironstone. Outcrops, breakaways	May, June, September, November	2.1	WAHerb TPFL NatureMap Stantec Stantec (2019) Recon Environmental (2008b)	Likely: The species has been recorded in close proximity to the Survey area and the Survey area may contain	Confirmed: This species was recorded in the Survey Area.

Appendix H. Fauna analysis table

Common name (Scientific name)	Conservation status		Habitat Preferences	Likelihood of occurrence and justification
	EPBC	WA		
Mammalia				
Chuditch (<i>Dasyurus geoffroi</i>)	Vu	Vu	Inhabits a range of forest, shrub and desert habitats, currently inhabits sclerophyll forest, dry woodland, heath and Mallee shrubland in southwest Australia (van Dyck and Strahan 2008). Den in hollow logs, burrows or rock crevices (DEC 2012a).	Likely While the Survey Area sits on the edge of the species current distribution (DEC 2012a, Woinarski <i>et al.</i> 2014), the species was recorded recently nearby. 140 records from 2017 and 2016 were detected in an area >60 km southeast of the Survey Area (DBCA 2020c). Additionally, Chuditch were opportunistically recorded via motion-sensing camera approximately 20 km southeast of the Survey Area during a March 2021 Stantec Survey (Stantec unpublished data). Remaining records of the species, located near Southern Cross and the Great Eastern highway, are over 20 years old (DBCA 2020c). Furthermore, the range of <i>Eucalyptus</i> woodlands and Mallee shrubland found within the Survey Area would provide suitable habitat. While trees in the Survey Area are unlikely to form hollows, areas supporting large woody debris or burrows may provide denning habitat. As such, the species is considered likely to occur.
Western Brush Wallaby (<i>Notamacropus irma</i>)		P4	Inhabits open woodland and forest, mallee and heath (DEC 2012b). The species also preferentially utilise open seasonally wet flats and scrub thickets (DEC 2012b).	Likely The Survey Area contains suitable habitat and occurs within the species range. The species was recorded opportunistically via motion camera approximately 22 km southeast of the Survey Area during a March 2021 Stantec Survey. 27 records from 2017 and 2016 were detected in one area >60 km southeast of the Survey Area (DBCA 2020c). As such, the species is considered likely to occur.
Black-footed Rock-wallaby (<i>Petrogale lateralis lateralis</i>)	En	En	Species is largely confined to granitic outcrops in mallee scrub (van Dyck and Strahan 2008).	Unlikely The Survey Area does not contain large areas of granite outcropping suitable for supporting the species, and the species was only recorded once ~39 km southwest of the Study Area during 2007 (DBCA 2020c). As such, the species is considered unlikely to occur.
Red-tailed Phascogale (<i>Phascogale calura</i>)	Vu	CD	Inhabits dense, tall forests, with a preference for Rock Sheoak (<i>Allocasuarina huegeliana</i>) and Wandoo woodlands with hollows for nesting sites (van Dyck and Strahan 2008).	Unlikely A single record of the species occurs in the immediate surrounds, however this dates back to 1998 (DBCA 2020c). The Survey Area contains suitable habitat such as <i>Eucalyptus</i> Woodlands, however falls on the edge of the species known distribution (Short and Hide 2012). Consequently, the species is considered unlikely to occur.

Numbat (<i>Myrmecobius fasciatus</i>)	En	En	Habitat dominated by Eucalypts providing hollow logs and woody debris for shelter and termites for foraging (van Dyck and Strahan 2008).	Unlikely While the Survey Area may contain suitable habitat, the species is restricted to isolated known populations that do not occur in the Survey Area (van Dyck and Strahan 2008). The species was only recorded at one undated location (DBCA 2020c).
Bilby (<i>Macrotis lagotis</i>)	Vu	Vu	Occupies a range of habitats including sandplains and dune fields with spinifex, acacia shrubland on red soils and stony downs and Mitchell Grass near cracking clay (van Dyck and Strahan 2008).	Unlikely While the Survey Area contains suitable habitat, the species is considered extinct from the Coolgardie and Avon Wheatbelt bioregions (Woinarski <i>et al.</i> 2014) and was not recorded recently. The current known range of the species is from the Tanami Desert west to Broome and south to Warburton in Western Australia (van Dyck and Strahan 2008). Consequently, the species is considered unlikely to occur within the Survey Area.
Aves				
Malleefowl (<i>Leipoa ocellata</i>)	Vu	Vu	Mainly scrubs and thickets of Mallee, Boree and Bowgada, but also other litter forming shrublands (Johnstone and Storr 1998). Sandy substrates and an abundance of leaf litter are required for the construction incubator mounds (Benshemesh 2007).	Likely Malleefowl have been recorded on numerous occasions in the surrounds (DBCA 2020b, Stantec 2021b). Seven active Malleefowl mounds have been recorded within 25 km of the Survey Area see Section 5.3.3 for details. Areas of thick vegetation within the <i>Eucalyptus</i> Woodlands habitat may provide suitable leaf litter for mound building.
Western Rosella (inland pop.) (<i>Platycercus icterotis xanthogenys</i>)		P4	Open forest and woodlands of Eucalypt and Sheoak with scrub, particularly those containing Wandoo, Flooded Gum, Salmon Gum, tall Mallee and <i>Allocasuarina huegeliana</i> (DEC 2009). The species nests in hollows of Mallee, Wandoo, York Gum, Flooded Gum and Salmon Gum trees (DEC 2009).	Likely The Western Rosella (inland pop.) occurs in the wheatbelt region east of Northam of Southwest WA, whilst the south-west population is found towards the south-west coast (DEC 2009, Menkhurst <i>et al.</i> 2017). Therefore all records near the Survey Area are that of the Western Rosella (inland pop.). The subspecies was recorded over 75 km southeast of the Survey Area in 2008 (Western Wildlife 2008) and regularly in the surrounds between 2013 and 2019 (Birdlife Australia 2019, DBCA 2020c). However, no Eucalypts likely to form hollows were found within the Survey Area. As such the species is considered likely to forage but unlikely to breed in the Survey Area.
Peregrine Falcon (<i>Falco peregrinus</i>)		OS	The species occurs along cliffs, gorges, wooded rivers, wetlands, plains and open woodlands, as well as in association with pylons and buildings. Nests on cliffs, in crevices, large tree hollows or on building ledges (Pizzey and Knight 2007).	Likely The species was recorded in the surrounds, including records in 2013 - 2015 and 2017 >20 km from the Survey Area (Birdlife Australia 2019, DBCA 2020c). Areas of mature Eucalypt trees may provide nesting habitat for the species however the species preferentially nests in cliff faces (Menkhurst <i>et al.</i> 2017). No Eucalypts likely to form hollows were found within the Survey Area. As such the species is considered likely to forage but unlikely to breed in the Survey Area.
Fork-tailed Swift (<i>Apus pacificus</i>)	Mi	IA	An aerial species, which forages high above the tree canopy and rarely lower (Johnstone and Storr 1998). Occurs over a range of habitats including islands, open country, coasts, semi-deserts, urban, forests (Pizzey and Knight 2007).	Unlikely This species is identified as occurring outside of the Survey Area using the protected matters search tool (DotEE 2020), however was not recorded recently nearby. The species forages over a range of habitats including those in the Survey Area, however is unlikely to rely on particular areas. As such, the species is considered unlikely to occur.
Curlew Sandpiper (<i>Calidris ferruginea</i>)	Cr; Mi	Cr	Small to large sized shore birds. Inhabit shallow aquatic areas on coasts, mudflats, saltmarshes, estuaries, lake margins and other inland waters and bore or grassy plains (Johnstone and Storr 1998, Menkhurst <i>et al.</i> 2017).	Unlikely No suitable habitat occurs within the Survey Area, and the species was flagged by the PMST (DotEE 2020) but was not recorded nearby, and the Survey Area occurs outside the species regular range (Menkhurst <i>et al.</i> 2017). As such the species is considered unlikely to occur within the Survey Area.
Four species from the family Scolopacidae • Sharp-tailed Sandpiper (<i>Calidris acuminata</i>) • Pectoral Sandpiper (<i>Calidris melanotos</i>) • Common Sandpiper (<i>Tringa hypoleucos</i>) • Common Greenshank (<i>Tringa nebularia</i>)	Mi	IA		Unlikely Four species from this family were identified in the database searches as having potential to occur, however only the Common Greenshank (2007 and 2011) and Common Sandpiper (2008) were recorded in the surrounds near Southern Cross (Birdlife Australia 2019, DBCA 2020c). The Sharp-tailed Sandpiper and Pectoral Sandpiper have no records within or near the Survey Area, but were flagged by the PMST (DotEE 2020). Furthermore, the Survey Area occurs in the irregular range of the Sharp-tailed Sandpiper and outside of the range of the Pectoral Sandpiper (Menkhurst <i>et al.</i> 2017). As the Survey Area does not contain any suitable habitat, these four species are considered unlikely to occur.
Hooded Plover (<i>Thinornis cucullatus</i>)		P4	A small shore bird species, inhabiting coastal beaches and lakes, and the margins of inland salt lake sin the southwest of Australia (Menkhurst <i>et al.</i> 2017)	Unlikely No suitable habitat occurs within the Survey Area, and the species was flagged by the PMST (DotEE 2020) but was not recorded nearby. As such the species is considered unlikely to occur within the Survey Area.
Night Parrot (<i>Pezoporos occidentalis</i>)	En	Cr	Known to inhabit treeless or sparsely wooded long unburnt spinifex hummock plains often interspersed with chenopods (Pyke and Ehrlich 2014).	Unlikely This species, or its habitats were identified as potentially occurring within the Survey Area using the PMST (DotEE 2020). However, the Survey Area does not contain spinifex, or other suitable roosting vegetation associated with drainage/ low lying areas that promote foraging (DPaW 2017, Murphy <i>et al.</i> 2017). While there are no records of the species nearby, there is limited information available regarding the species range and the species is elusive and seldomly recorded. However the Survey Area occurs outside priority areas for species surveys and the species range (DPaW 2017, Menkhurst <i>et al.</i> 2017).

Grey Wagtail (<i>Motacilla cinerea</i>)	Mi	IA	Grey Wagtails are listed as rare vagrants to the Australian continent from the North. Inhabit areas associated with water including running water/ streams, sewage ponds, swamp margins and saltmarshes and lawns, ploughed fields and airfields (Pizzey and Knight 2007).	Unlikely This species, or its habitats were identified as potentially occurring within the Survey Area using the PMST (DotEE 2020). No records of the species exist near the Survey Area and there is minimal habitat suitable for the species. As such, the species is considered unlikely to occur.
Reptilia				
Woma Python (southwest pop) (<i>Aspidites ramsayi</i>)		P1	Woodlands, heaths and shrublands, often with spinifex. Shelters mainly in abandoned monitor and mammal burrows and in soil cracks (Wilson and Swan 2013), with evidence of arboreal behaviour identified (Bruton 2013).	Likely Database searches returned six records for the species occurring within approximately 20 km of the Survey Area, however, all records are undated vouchered specimens (DBCA 2020b, c). Despite this, as the Survey Area contains suitable habitat and occurs within the species range, the species is considered likely to occur.
Lake Cronin Snake (<i>Paroplocephalus atriceps</i>)		P3	Occurs in a relatively restricted area, found in the vicinity of Lake Cronin and on a granite outcrop called Peak Eleonora	Possible The species was recorded on one occasion in the surrounds in 2007, ~50km southeast of the Survey Area (DBCA 2020c). As the Survey Area occurs just north of the species predicted range, which is relatively restricted, the species is considered to possibly occur.
Invertebrates				
Brine shrimp (<i>Parartemia contracta</i>)		P1	Inland acidic salt lakes to pH 3.5 in the northern, central and southern Wheatbelt of Western Australia (Timms 2014).	Unlikely The species was recorded in the Threatened and Priority Fauna database four times between 1997 and 2007 at Moorine South Lake over 30 km from the Survey Area (DBCA 2020c). However, the Survey Area does not contain suitable habitat and as such the species is considered unlikely to occur.
Water flea (<i>Daphnia jollyi</i>)		P1	Restricted to shallow, soft-water, granite-rock domes in the wheatbelt region of Western Australia (Colbourne et al. 2006).	Unlikely This species was recorded from 1990 to 2007 over 16 km from the Survey Area (DBCA 2020c). No areas of granite rock occur within the Survey Area; thus the species is considered unlikely to occur.
Tree-stem trapdoor spider (<i>Aganippe castellum</i>)		P4	Flood-prone depressions and flats which support myrtaceous shrub communities. areas with Broombush (<i>Melaleuca uncinata</i>) and Sheoaks (such as <i>Allocasuarina acutivalvis</i>) in sandy loam soils are important habitat for the species (Inglis 2008).	Likely This species was recently recorded approximately 22 km southeast of the Survey Area in 2007 and from two locations >60km south of the Survey Area in 2009 (DBCA 2020c). Based on the proximity of records and similar habitat to the current Survey Area, this species is considered likely to occur.

Appendix I. Sources of information

I.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Bush Forever (Regional Scheme) (DPLH-022)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- 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)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Interim Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- Soil Landscape Mapping – Rangelands (DPIRD-064)

- WA Now Aerial Imagery

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

I.2. References

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- Stantec (2021a) Lenneberg Native Vegetation Clearing Permit Application Supporting Document. Prepared for Barto Gold Mining Pty Ltd, by Stantec Australia Pty Ltd, December 2021.
- Stantec (2021b) Lenneberg Flora, Vegetation and Fauna survey. Prepared for Barto Gold Mining Pty Ltd, by Stantec Australia Pty Ltd, October 2021.
- Stantec (2021c) Memorandum – Results of targeted Chuditch survey. Prepared for Barto Gold Mining Pty Ltd, by Stantec Australia Pty Ltd, August 2021.
- Western Australian Herbarium (1998–) Florabase—the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. <https://florabase.dpaw.wa.gov.au/> (Accessed 25 Jul 2022).

4. Glossary

Acronyms:

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

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

Definitions:

{DBC (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.