Government of Western Australia
Department of Mines, Industry Regulation and Safety

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 8907/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Beacon Mining Pty Ltd**

1.3. Property details

Property: Mining Lease 16/365
Local Government Area: Shire of Coolgardie
Colloquial name: Panther Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
40		Mechanical Removal	Mineral Production and Associated Activities

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 9 July 2020

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description

The vegetation of the application area is broadly mapped as the following Beard vegetation association:
8: Medium woodland; salmon gum & gimlet (GIS Database).

A targeted Threatened flora survey was conducted over the application area by NVS (2020) during April 2020. NVS (2020) confirmed that vegetation present within the application area is representative of the vegetation types described by a level 2 flora and vegetation survey conducted by NVS in July 2017 of the nearby Jaurdi Hills Project area, approximately 2.5 kilometres south-east of the application area (NVS, 2017).

The following vegetation types were recorded within the Jaurdi Hills Project area (NVS, 2017):

***A. Eucalyptus griffithsii* and *E. campaspe* over *Acacia acuminata* over mixed sclerophyll shrubland**
Open Shrub Mallee of *Eucalyptus griffithsii* and *E. campaspe* over *Acacia acuminata* and *Eremophila oldfieldii* subsp. *angustifolia* over *Dodonaea lobulata, Scaevola spinescens, Beyeria sulcata* var. *sulcata* and *Ptilotus obovatus*.

B. *Eucalyptus campaspe* and *Eucalyptus clelandii* woodland
Low Woodland of *Eucalyptus campaspe* and *E. clelandii* over *Eremophila oldfieldii* subsp. *angustifolia, Eremophila interstans* subsp. *virgata and Senna artemisioides* subsp. *filifolia* over *Atriplex nummularia* subsp. *spathulata, Eremophila scoparia, Acacia erinacea, Eremophila pustulata, Olearia muelleri* and *Ptilotus obovatus.*

C. *Eucalyptus griffithsii* woodland over Chenopod shrublands
Open Tree Mallee of *Eucalyptus griffithsii* over *Eremophila alternifolia* and *Atriplex nummularia* subsp. *spathulata* over *Senna artemisioides* subsp. *filifolia, Atriplex stipitata* and *Ptilotus obovatus.*

D. Open Chenopod shrubland
Tall Open Shrubland of *Eremophila interstans* subsp. *virgata* and *Atriplex nummularia* subsp. *spathulata* over *Eremophila scoparia* and *Senna cardiosperma* over *Atriplex stipitata*.

E. *Eucalyptus salmonophloia* woodland
Woodland of *Eucalyptus salmonophloia* with occasional *E. transcontinentalis* over occasional *E. oleosa* subsp. *oleosa* over *Eremophila scoparia, Exocarpos aphyllus, Eremophila caperata, Eremophila interstans* subsp. *virgata* and *Eremophila ionantha* over *Olearia muelleri, Senna artemisioides* subsp. filifolia, *Atriplex vesicaria, Atriplex stipitata, Senna cardiosperma, Acacia hemiteles, Ptilotus obovatus* and *Scaevola spinescens*.

F. Mixed *Eucalyptus* woodland over sclerophyll shrubland
Low Woodland of *Eucalyptus clelandii, Eucalyptus salubris, Eucalyptus oleosa* subsp. *oleosa, Eucalyptus griffithsii* and occasional *Casuarina pauper* over *Eremophila interstans* subsp. *virgata, Santalum acuminatum, Eremophila caperata, and Eremophila oldfieldii* subsp. *angustifolia,* over *Senna artemisioides* subsp. *filifolia, Eremophila glabra* subsp. *glabra, Olearia muelleri, Acacia hemiteles, Eremophila pustulata* and *Eremophila parvifolia* subsp. *auricampa.*

G. Eucalyptus thicket in open depressions
Low Open Forrest of *Eucalyptus clelandii, E. salubris and E. oleosa* subsp. *oleosa* over *Senna artemisioides* subsp. *filifolia, Acacia merrallii, Exocarpos aphyllus* and *Eremophila scoparia* over *Acacia colletioides, Eremophila ionantha* and *Eremophila decipiens* subsp. *decipiens.*

H. *Eucalyptus oleosa* subsp. *oleosa* over Chenopod shrublands
Open Shrub Mallee of *Eucalyptus oleosa subsp. oleosa* with occasional *E. yilgarnensis* over *Eremophila interstans* subsp. *virgata* and *Eremophila scoparia* over *Cratystylis subspinescens, Cratystylis conocephala, Eremophila decipiens* subsp. *decipiens* and *Eremophila parvifolia* subsp. *auricampa*.

I. *Eucalyptus* over *Melaleuca sheathiana* over *Cratystylis conocephala* on calcrete rises
Low Woodland of *Eucalyptus clelandii* over *Melaleuca sheathiana, Acacia hemiteles* and *Exocarpos aphyllus* over *Cratystylis conocephala, Westringia rigida, Grevillea acuaria, Acacia colletioides* and *Eremophila scoparia*.

Clearing Description

Panther Project.
Beacon Mining Pty Ltd proposes to clear up to 40 hectares of native vegetation within a boundary of approximately 58.1 hectares, for the purpose of mineral production and associated activities. The project is located approximately 50 kilometres west of Kalgoorlie-Boulder, within the Shire of Coolgardie.

Vegetation Condition

Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).

To

Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).

Comment

The vegetation condition was derived from a vegetation survey conducted by NVS (2017) of the nearby Jaurdi Hills Project area (CPS 7794/1).

The proposed clearing is for an open pit cutback, waste landform extension and associated infrastructure.

3. Assessment of application against Clearing Principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments

Proposal is not likely to be at variance to this Principle

The clearing permit application area is located within the Eastern Goldfields subregion of the Interim Biogeographic Regionalisation for Australia (IBRA) Coolgardie Bioregion (GIS Database). The Eastern Goldfields subregion is characterised by undulating plains interrupted by low hills and ridges, supporting mallees, *Acacia* thickets and shrub-heaths on sandplains, and diverse *Eucalyptus* woodlands around salt lakes, on ranges, and in valleys. Salt lakes support dwarf shrublands of samphire. The subregion is rich in endemic *Acacia* species (CALM, 2002).

The application area falls on the northern edge of the area known as the Great Western Woodlands, which represents the largest and most intact eucalypt woodland remaining in southern Australia and is one of the best examples of its type in the world (DEC, 2010). The Great Western Woodlands covers a total area of approximately 16 million hectares, and is recognised for its flora and fauna species richness and high number of endemic flora species (DEC, 2010). However, at approximately 40 hectares in size, the clearing permit application area represents less than 0.01 percent of the area covered by the Great Western Woodlands, and the proposed clearing of 40 hectares is unlikely to have any significant impact on the conservation values of the Great Western Woodlands.

A targeted Threatened flora survey was conducted over the application area by NVS (2020) during April 2020. NVS (2020) confirmed that vegetation present within the application area is representative of the vegetation types described by a level 2 flora and vegetation survey of the nearby Jaurdi Hills Project area, conducted by NVS in July 2017 (NVS, 2017). Nine major vegetation types were recorded within the adjacent site and surrounding areas, comprising mainly of Mallees, *Eucalyptus* woodlands, Sclerophyll shrubland and Chenopod shrubland (NVS, 2017). The vegetation types identified within the application area are common and widespread throughout the Eastern Goldfields subregion and adjoining regions (NVS, 2017). No Threatened or Priority Ecological Communities were identified as potentially occurring in the application area and the field assessment of the application area did not record any (NVS, 2020; GIS Database).

A desktop assessment identified two Threatened and 39 Priority flora species to occur within a 50 kilometre radius of the application area (NVS, 2020). Two of the 41 Threatened or Priority flora species may potentially occur within the application area given there is suitable habitat (NVS, 2020). *Notisia intonsa* (P3) was recorded within 35 kilometres of the application area and *Eremophila praecox* (P2) was recorded within the Jaurdi Hills Project area, within 10 kilometres of the application area (NVS, 2020). The targeted survey was conducted at a sub-optimal time and it is possible that *Notisia intonsa* and *Eremophila praecox* were present and not detected. *Notisia intonsa* is an annual and would not have been identified by a survey conducted in April, however records of this species indicate that it is not regionally restricted and therefore unlikely to be significantly impacted by the proposed clearing (Western Australian Herbarium, 1998-). *Eremophila* are difficult to identify to species level outside the ideal flowering period (October to December for *Eremophila praecox*). There are 12 records of *Eremophila praecox* on FloraBase, five of which were recorded within the last 10 years (Western Australian Herbarium, 1998-). *Eremophila praecox* is restricted to the Eastern Goldfields subregion and most

records on FloraBase show the presence of this species in the local area (Western Australian Herbarium, 1998-). Vegetation types where *Eremophila praecox* has been recorded extend beyond the application area, and are common and widespread throughout the region (NVS, 2017). If individuals of this species are present within the application area, the proposed clearing is unlikely to have a significant impact on the local population. No Threatened or Priority flora were recorded during the field assessment (NVS, 2020).

NatureMap identified one amphibian, 64 birds, three mammals and 17 reptiles having previously been recorded within 20 kilometres of the application area (DBCA, 2020). Five conservation significant fauna species were identified, four of which are migratory bird species and unlikely to utilise the application area given there is no suitable habitat due to a lack of permanent wetlands within the application area (DBCA, 2020; NVS, 2017; GIS Database). There is some suitable habitat within the application area that Malleefowl may utilise for foraging or nesting (GIS Database). Fauna habitats recorded within the application area are widespread throughout the region and the proposed clearing is unlikely to impact the biodiversity of the area.

The vegetation associations, fauna habitats and landform types present within the application area, are well represented in surrounding areas (NVS, 2017; GIS Database). The application area is unlikely to represent an area of higher biodiversity than surrounding areas, in either a local or regional context.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology

CALM (2002)
DBCA (2020)
DEC (2010)
NVS (2017)
NVS (2020)
Western Australian Herbarium (1998-)

GIS Database:
- IBRA Australia
- Imagery
- Pre-European Vegetation
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers
- Threatened and Priority Flora
- Threatened Fauna

(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 indigenous to Western Australia.

Comments

Proposal may be at variance to this Principle

A level 1 reconnaissance fauna survey was undertaken within the adjacent Jaurdi Hills Project area on 13 July 2017 by Terrestrial Ecosystems (2017), approximately 2.5 kilometres south-east of the application area. The fauna habitats within the application area reflect those identified within the adjacent Jaurdi Hills Project area (NVS, 2020).

The following four fauna habitats were recorded within the adjacent Jauradi Hills Project area (Terrestrial Ecosystems, 2017):

- sparse eucalypt woodland (*Eucalyptus campaspe*, *Eucalyptus clelandii*, *Eucalyptus salmonophloia*) over chenopod shrubland on red sandy clay substrate;
- eucalypt thickets with a ground cover of leaf litter mostly in open depressions on red sandy clay substrate;
- eucalypt woodland (*Eucalyptus griffithsii*, *Eucalyptus campaspe*) over *Acacia* species over mixed sclerophyll shrubland on stony clay; and
- highly disturbed and degraded areas.

According to the EPBC Protected Matters Search Tool, there are 12 conservation significant fauna species or species habitat that may occur within a 5 kilometre radius of the application area (DAWE, 2020). The majority of these fauna species are migratory or marine birds that primarily utilise wetland areas. NatureMap identified two additional migratory species that have been previously recorded within 20 kilometres of the application area (DBCA, 2020). The Red-necked Stint (*Calidris ruficollis*) and the Common Greenshank (*Tringa nebularia*) are both migratory species that utilise wetland areas. Given the lack of permanent wetlands or watercourses within the application area, these species are unlikely to be impacted by the proposed clearing. Terrestrial Ecosystems (2017) identified potentially suitable habitat for migratory species the Fork-tailed Swift (*Apus pacificus*) and the Rainbow Bee-eater (*Merops ornatus*) within the Jaurdi Hills Project area due to previous records within the vicinity or are known to inhabit the Goldfields region during spring. As these species are highly mobile and have large home ranges, the application area is unlikely to provide significant habitat for these species.

A targeted Malleefowl (*Leipoa ocellata*, VU at a state and federal level) mound survey was conducted over the application area during April 2020 (NVS, 2020). No Malleefowl mounds were recorded within the application area (NVS, 2020). NatureMap identified one previous record of Malleefowl within a 10 kilometre radius of the

application area (DBCA, 2020). Malleefowl prefer a densely vegetated habitat with ample leaf litter to construct nesting mounds. Based on aerial imagery, there is vegetation towards the north of the application area that may be suitable for foraging and nesting habitat due to vegetation density (GIS Database). The proposed clearing may impact on potential Malleefowl habitat. Potential impacts to Malleefowl as a result of the proposed clearing may be minimised by the implementation of a fauna management condition.

The fauna habitats recorded within the application area are considered to be well represented throughout the region, (Terrestrial Ecosystems, 2017) and the local area retains large amounts of native vegetation (GIS Database). Based on this, the vegetation proposed to be cleared is unlikely to represent significant habitat for fauna in a regional context.

Based on the above, the proposed clearing may be at variance to this Principle.

Methodology

DAWE (2020)
DBCA (2020)
NVS (2017)
NVS (2020)
Terrestrial Ecosystems (2017)

GIS Database:
- Imagery
- Pre-European Vegetation
- Threatened Fauna

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Comments

Proposal is not likely to be at variance to this Principle

There are no known records of Threatened flora within the application area (GIS Database). A targeted threatened flora survey was conducted over the application area on 4 April and 28 April 2020 and no Threatened flora was identified (NVS, 2020). A desktop assessment found that Threatened species *Gastrolobium graniticum* may occur or suitable habitat may occur within a 5 kilometre radius of the application area (DAWE, 2020). The targeted flora survey identified that there is a lack of suitable habitat within the application area to host *Gastrolobium graniticum* (NVS, 2020)

The vegetation associations within the application area are common and widespread within the region (NVS, 2017; GIS Database), and the vegetation proposed to be cleared is unlikely to be necessary for the continued existence of any species of Threatened (rare) flora.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology

DAWE (2020)
NVS (2017)
NVS (2020)

GIS Database:
- Pre-European Vegetation
- Threatened and Priority 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.

Comments

Proposal is not likely to be at variance to this Principle

There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the application area (GIS Database).

A flora and vegetation survey of the application area did not identify any TECs (NVS, 2020).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology

NVS (2020)

GIS Database:
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers

(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.

Comments

Proposal is not likely to be variance to this Principle

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 8: Medium woodland; salmon gum & gimlet (GIS Database). Approximately 49% of the pre-European extent of this vegetation association remains uncleared at a state level and approximately 98% at a bioregional level (Government of Western Australia, 2019).

Approximately half of vegetation association 8: Medium woodland; salmon gum & gimlet has been cleared at a state level, giving it a conservation status of 'depleted'. However, 98% of this vegetation association remains at the bioregional level. The application area is not a significant remnant of native vegetation in an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in DBCA managed lands
IBRA Bioregion – Coolgardie	12,912,204	12,648,491	~97	Least Concern	16.39
Beard vegetation associations – WA					
8	694,638	346,425	~49	Depleted	6.81
Beard vegetation associations – Coolgardie Bioregion					
8	280,248	275,589	~98	Least Concern	9.52

* Government of Western Australia (2019)
** Department of Natural Resources and Environment (2002)

Based on the above, the proposed clearing is not likely to be variance to this Principle.

Methodology

Department of Natural Resources and Environment (2002)
Government of Western Australia (2019)

GIS Database:
- IBRA Australia
- Pre-European Vegetation

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments

Proposal may be at variance to this Principle

There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database).

There are multiple ephemeral drainage lines that pass through the application area (GIS Database). Drainage lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall (CALM, 2002). Most of the drainage lines in the application area have previously been disturbed due to existing mining activity within the application area (GIS Database).

Based on the above, the proposed clearing may be at variance to this Principle. Potential impacts to vegetation growing in association with the watercourse may be minimised by the implementation of a watercourse management condition.

Methodology

CALM (2002)

GIS Database:
- Hydrography, Lakes
- Hydrography, linear
- Imagery

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments

Proposal may be at variance to this Principle

The soils of the application area are mapped as soil type BB5: Rocky ranges and hills of greenstones and basic igneous rocks, shallow calcareous loamy soils (Northcote et al., 1960-68).

The application area has an established mining pit, with areas of cleared vegetation surrounding it (GIS Database). Aerial imagery of the application area shows that soil run off has occurred, primarily within drainage lines that run through the application area (GIS Database).

There may be a potential for further erosion to occur due to the presence of drainage lines within the application area (GIS Database). Potential impacts from erosion as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

Based on the above, the proposed clearing may be at variance to this Principle.

Methodology Northcote et al. (1960-68)

GIS Database:
- Hydrography, linear
- Imagery
- Soils, Statewide
- Topographic Contours, Statewide

(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.

Comments **Proposal is not likely to be at variance to this Principle**

There are no conservation areas in the vicinity of the application area. The nearest DBCA (formerly DPaW) managed land is the Credo Conservation Park and former pastoral lease which is located approximately 14 kilometres north of the application area (GIS Database). The proposed clearing is unlikely to impact on the environmental values of any conservation area.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology GIS Database:
- DPaW Tenure

(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.

Comments **Proposal is not likely to be at variance to this Principle**

There are no Public Drinking Water Source Areas within or in close proximity to the application area (GIS Database). Broad Arrow Dam Catchment Area is located approximately 46 kilometres north-east of the application area (GIS Database). The proposed clearing is unlikely to cause deterioration in the quality of underground water.

There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database). Drainage lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall (CALM, 2002). The proposed clearing is unlikely to result in significant changes to surface water flows.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology CALM (2002)

GIS Database:
- Hydrography, Linear
- Public Drinking Water Source Areas

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments **Proposal is not likely to be at variance to this Principle**

The climate of the region is semi-arid, with a low average rainfall of approximately 250-300 millimetres per year (BoM, 2020; NVS, 2017).

There are no permanent water courses or waterbodies within the application area (GIS Database) and drainage lines in the area are dry for most of the year, only flowing briefly immediately following significant rainfall (CALM, 2002; GIS Database). The proposed clearing is unlikely to increase the incidence or intensity of natural flooding events.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology BoM (2020)

CALM (2002)
NVS (2017)

GIS Database:
- Hydrographic Catchments - Catchments
- Hydrography, linear

Planning Instrument, Native Title, previous EPA decision or other matter.

Comments

The clearing permit application was advertised on 1 June 2020 by the Department of Mines, Industry Regulation and Safety (DMIRS), inviting submissions from the public. No submissions were received in relation to this application.

There are two native title claims (WC2017/001; WC2017/007) over the area under application (DPLH, 2020). These claims have been registered with the National Native Title Tribunal on behalf of the claimant groups. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no registered Aboriginal Sites of Significance within the application area (DPLH, 2020). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Water and Environmental Regulation and the Department of Biodiversity, Conservation and Attractions, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

Methodology DPLH (2020)

4. References

BoM (2020) Bureau of Meteorology Website – Climate Data Online, Kalgoorlie-Boulder Airport. Bureau of Meteorology. http://www.bom.gov.au/climate/data/ (Accessed 22 June 2020).

CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.

DAWE (2020) Protected Matters Search Tool, Report by Coordinates. Australian Government. http://www.environment.gov.au/webgis-framework/apps/pmst/pmst-coordinate.jsf (Accessed 1 July 2020).

DBCA (2020) NatureMap. Mapping Western Australia's Biodiversity. Government of Western Australia. https://naturemap.dbca.wa.gov.au/ (Accessed 1 July 2020)

DEC (2010) A Biodiversity and Cultural Conservation Strategy for the Great Western Woodlands. Department of Environment and Conservation, Western Australia.

DPLH (2020) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. http://maps.daa.wa.gov.au/AHIS/ (Accessed 22 June 2020).

Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.

Government of Western Australia (2019) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth. https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics

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

Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68): 'Atlas of Australian Soils, Sheets 1 to 10, with explanatory data'. CSIRO and Melbourne University Press: Melbourne.

NVS (2017) Jaurdi Hills Level 2 Flora And Vegetation Survey. Report prepared by Native Vegetation Solutions, for Beacon Mining Pty Ltd, September 2017.

NVS (2020) Targeted Threatened Flora and Malleefowl Mound Survey – Panther Project. Report prepared by Native Vegetation Solutions, for Beacon Mining Pty Ltd, April 2020.

Terrestrial Ecosystems (2017) Level 1 Vertebrate Fauna Risk Assessment for the Jaurdi Hills Mining Area. Report prepared by Terrestrial Ecosystems, for Beacon Mining Pty Ltd, August 2017.

Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. https://florabase.dpaw.wa.gov.au/ (Accessed 7 July 2020).

5. Glossary

Acronyms:

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)
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DEC	Department of Environment and Conservation, Western Australia (now DBCA and DWER)
DoEE	Department of the Environment and Energy, Australian Government
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)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora
DoE	Department of the Environment, Australian Government (now DoEE)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DoEE)
DWER	Department of Water and Environmental Regulation, Western Australia
EPA	Environmental Protection Authority, Western Australia
EP Act	*Environmental Protection Act 1986*, Western Australia
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (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	*Rights in Water and Irrigation Act 1914*, Western Australia
TEC	Threatened Ecological Community

Definitions:

{DBCA (2019) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia}:-

T **Threatened species:**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR **Critically endangered species**
Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN **Endangered species**
Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU **Vulnerable species**

Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct Species:

EX **Extinct species**
Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW **Extinct in the wild species**
Species that *"is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species:

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI **Migratory species**
Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD **Species of special conservation interest (conservation dependent fauna)**
Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS **Other specially protected species**
Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P **Priority species:**

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories

are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

P1 **Priority One - Poorly-known species**
Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

P2 **Priority Two - Poorly-known species**
Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

P3 **Priority Three - Poorly-known species**
Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

P4 **Priority Four - Rare, Near Threatened and other species in need of monitoring**
(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.
(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.
(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.