



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 9035/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: Newcrest Operations Limited

### 1.3. Property details

Property: Mining Lease 45/1287  
Local Government Area: Shire of East Pilbara  
Colloquial name: Havieron Project

### 1.4. Application

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

### 1.5. Decision on application

Decision on Permit Application: Grant  
Decision Date: 26 November 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: 134: Mosaic: Hummock grasslands, open low tree steppe; desert bloodwood and feathertop spinifex on sandhills / Hummock grasslands, shrub steppe; mixed shrubs over spinifex between sandhills (GIS Database).

A flora and vegetation survey was conducted over the application area by Stratagen JBS&G (Stratagen) during 4-12 March 2020 and resurveyed during 28 June to 5 July 2020. The following vegetation types were recorded within the application area (Stratagen, 2020):

#### Mixed High Shrubland

**4b:** Scattered Trees of *Corymbia* over *Acacia stipuligera* and *Grevillea wickhamii*. *Acacia stellaticeps*, *Jacksonia aculeata* and *Calytrix carinata* Low Open Shrubland over *Triodia basedowii* complex and *T. schinzii* Closed Hummock Grassland.

#### Triodia Hummock Grassland

**6b:** *Grevillea wickhamii* Open Shrubland over *Acacia stellaticeps* and *Tribulus*. Low Open Shrubland over *Triodia epactia* Hummock Grassland *Acacia* sp. Over *Triodia*.

**6e:** Fringing vegetation associated with Clay Pans. Typical community consists of *Acacia stellaticeps* over *Triodia epactia* and *Triodia basedowii*.

**6g:** Scattered Tall Shrubs of *Grevillea wickhamii* and *Hakea chordophylla* over *Triodia* aff. *basedowii* Hummock Grassland.

**6i:** Scattered trees of *Eucalyptus victrix* over *Acacia cuthbertsonii* subsp. *cuthbertsonii* and *Senna artemisioides* subsp. *oligophylla* open shrubland over *Triodia schinzii* hummock grassland.

**Clearing Description** Havieron Project.  
Newcrest Operations Limited proposes to clear up to 153 hectares of native vegetation within a boundary of approximately 2,493 hectares, for the purpose of mineral production and associated infrastructure. The project is located approximately 305 kilometres east of Marble Bar, within the Shire of East Pilbara.

**Vegetation Condition** Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).

**Comment** The vegetation condition was derived from a vegetation survey conducted by Stratagen (2020).

The proposed clearing is for a boxcut mine and decline development to a depth of approximately 400-420 metres below ground level, accommodation camp, access tracks, waste rock landform, topsoil and subsoil stockpile, and

### 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 Mackay subregion of the Interim Biogeographic Regionalisation for Australia (IBRA) Great Sandy Desert Bioregion (GIS Database). Much of the Mackay subregion is characterised by red longitudinal sand dune fields supporting tree steppe grading to shrub steppe in the south; comprising open hummock grassland of *Triodia pungens* and *Triodia schinzii* with scattered trees of *Owenia reticulata* and bloodwood (*Corymbia* spp.), and shrubs of *Acacia* species, *Grevillea wickhamii* and *Grevillea refracta*. Gently undulating uplands support shrub steppe such as *Acacia pachycarpa* shrublands over *Triodia pungens* hummock grass. Salt lake chains support samphire low shrublands, and *Melaleuca glomerata* and *Melaleuca lasiandra* shrublands. *Casuarina decaisneana* (Desert Oak) occurs in the south and east of the subregion (CALM, 2002).

A detailed flora and vegetation survey was conducted over the application area and surrounds but Stratagen (2020) on 4-12 March 2020 and 28 June to 5 July 2020. The vegetation of the application area is dominated by *Triodia* hummock grasslands, interspersed by open shrublands of *Acacia stipuligera* and *Grevillea wickhamii*, and scattered *Corymbia* trees (Stratagen, 2020). The overall vegetation condition is considered to be 'excellent', however some areas that have been previously cleared are considered 'completely degraded' (Newcrest, 2020a; Stratagen, 2020; Keighery, 1994). Parts of the application area experienced a fire in 2019 which has resulted in variation in biodiversity within the same vegetation types (Stratagen, 2020). Fire ephemerals and pyrophytic species were represented in larger numbers when compared to unburnt areas of the same vegetation type (Stratagen, 2020). No Threatened or Priority Ecological Communities were identified as potentially occurring within the application area and none of the vegetation types mapped and described are listed as Threatened or Priority Ecological Communities (Newcrest, 2020a; Stratagen, 2020; GIS Database).

A total of 62 flora species from 44 genera and 23 families were recorded within the application area and surrounds (Stratagen, 2020). A desktop assessment identified 11 flora species of conservation significance as potentially occurring within 100 kilometres of the application area (Stratagen, 2020). Of the 11 flora species, only three are considered to potentially occur within the application area given there is suitable habitat present: *Goodenia hartiana* (P2), *Indigofera ammobia* (P3), and *Goodenia nuda* (P4) (Stratagen, 2020). No Threatened or Priority flora were recorded within the application area and none of the Priority flora species potentially present are locally or regionally restricted, and occur across multiple IBRA regions (Western Australian Herbarium, 1998-). The proposed clearing is unlikely to have a significant impact on the conservation status of Priority flora potentially present.

A desktop assessment identified a total of 332 vertebrate fauna species which have previously been recorded or have the potential to occur within the application area and surrounds (Biologic, 2020). This includes 60 mammals (53 native and seven non-native), 161 birds, 101 reptiles and ten amphibians (Biologic, 2020). Of the 332 fauna species, 38 are of conservation significance, including 16 mammal, 21 bird and one reptile species (Biologic, 2020). 18 of the 38 conservation significant fauna species were considered possibly occurring within the application due to suitable habitat present, with two considered likely to occur, however none were considered to be reliant upon the application area for habitat (Biologic, 2020).

A total of 96 vertebrate species, comprising of 18 mammals (16 native and two introduced), 38 birds, 35 reptiles and five amphibians were recorded during the field assessment of the application area and surrounds (Biologic, 2020). Evidence of two conservation significant fauna species was recorded within the application area, including: greater bilby (*Macrotis lagotis*, VU at federal and state level) and northern marsupial mole (*Notoryctes caurinus*, P4) (Biologic, 2020). Presence of greater bilby was recorded within the application area from diggings, scats, an inactive burrow, and tracks, however individuals have been recorded on camera traps in the surrounds (Biologic, 2020). DBCA (2020) have recommended an exclusion buffer zone around primary habitat identified within the application area to minimise disturbance to greater bilbies (Biologic, 2020). Potential impacts to greater bilbies may be minimised through the implementation of a fauna management condition, including a 50 metre buffer exclusion zone around primary bilby habitat where no clearing is to occur. No northern marsupial mole individuals were recorded during the field survey, however eight inactive burrows/tunnels were recorded within the application area (Biologic, 2020). The species is unlikely to be significantly impacted by the proposed clearing as northern marsupial mole is not considered reliant upon habitat within the application area.

The recent large-scale fire across parts of the application area has likely had an impact on the fauna species diversity and abundance within the application area as a result of the degraded condition of vegetation structure and abundance in some areas (Biologic, 2020). Faunal assemblages were considered to be typical of the broad fauna habitats present within the application area and within the Great Sandy Desert region (Biologic, 2020).

The vegetation association, fauna habitats and landform types present within the application area, are well represented in surrounding areas (Biologic, 2020; Newcrest, 2020a; Stratagen, 2020; 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** Biologic (2020)  
CALM (2002)  
DBCA (2020)  
Keighery (1994)  
Newcrest (2020a)  
Stratagen (2020)  
Western Australian Herbarium (1998-)

GIS Database:  
- IBRA Australia  
- 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 is at variance to this Principle**

A detailed vertebrate fauna survey was conducted during 16-27 March 2020 and 31 May to 14 June 2020 by Biologic (2020). The following three broad fauna habitats were recorded within the application area (Biologic, 2020; Newcrest, 2020a):

**Sand plain:** flat to low undulating areas, often between parallel sand dune habitat with vegetation dominated by *Triodia* hummock grasses of various life stages and scattered patches of various small to medium shrub species (including *Acacia* and *Melaleuca* species) on sandy to clay loam substrates.

**Sand dune:** low to high red parallel sand dunes, often separated by sand plain habitat with vegetation largely dominated by *Triodia* hummock grasses and various scattered small to medium shrubs (usually *Acacia*) with scattered tree and mallee eucalypts occurring on upper dune slopes and crests, on sandy to sandy loam substrates.

**Claypan:** low lying areas, often amongst sand plain habitat often sparsely vegetated or with deceased vegetation from periods where water is present (i.e. rushes and various tussock grasses) on a hard clay to clay loam substrate. The structure and condition of vegetation is likely to vary seasonally, particularly following heavy rainfall events when inundation is likely to occur.

The condition of the fauna habitats within the application area ranged from excellent to pristine (Biologic, 2020; Keighery, 1994). The majority of the application area consists of sand plain habitat (Biologic, 2020). Sand plain and sand dune habitats are deemed to be of high significance as they potentially provide suitable foraging, breeding, and dispersal habitat for multiple species of conservation significance (Biologic, 2020). However, none of the fauna habitats present are restricted to the application area, all fauna habitats are well represented in the surrounds and are common and widespread throughout the region (Biologic, 2020). A recent fire through parts of the application area has resulted in areas with little to no vegetation remaining or only limited recent natural post-fire regrowth (Biologic, 2020). The fire has altered fauna habitat availability, where unburnt areas provide higher value habitat and burnt areas are currently considered to be of lower value to fauna (Biologic, 2020).

Two conservation significant species were recorded within the application area and surrounds by secondary evidence (diggings, tracks, burrows/tunnels, or scats) or on camera traps, including: greater bilby (*Macrotis lagotis*, VU at federal and state level) and northern marsupial mole (*Notoryctes caurinus*, P4) (Biologic, 2020).

Records of greater bilby occurred throughout sand plain and sand dune habitats within the application area and surrounds (Biologic, 2020). No individuals were identified from camera traps within the application area, however there was evidence of diggings, scats, an inactive burrow, and tracks belonging to greater bilby within the application area (Biologic, 2020). The majority of the application area is considered supporting habitat (secondary habitat) for bilbies to forage, breed or disperse due to the recent fire in the area (Biologic, 2020). Bilbies are unlikely to burrow or breed within areas that have been burnt, however many of the plant species that make up the bilby's diet are fire-germinated species (Biologic, 2020). Bilbies are likely to venture into burnt areas during foraging and dispersal movements (Biologic, 2020; DBCA, 2020). There is an area of approximately 20.5 hectares of unburnt habitat within the eastern portion of the application area that is considered necessary for activities such as foraging, breeding or dispersal (primary habitat) (Biologic, 2020; Newcrest, 2020a). If clearing of primary bilby habitat is avoided and indirect disturbance minimised, then bilbies will likely continue to use the primary habitat while resources are available (DBCA, 2020). Newcrest (2020b) have stated within their bilby management plan that clearing of primary habitat will be avoided where possible. DBCA (2020) have recommended an exclusion buffer zone around primary habitat within the application area to minimise disturbance to the species. A fauna management condition is recommended to mitigate potential

impacts to greater bilbies, including a 50 metre exclusion buffer around primary bilby habitat.

Eight inactive northern marsupial mole burrows/tunnels were recorded within the application area in sand dune habitat (Biologic, 2020). The inactive burrows ranged from recent to old, however a range of environmental factors may have influenced the structural integrity of the burrows (Biologic, 2020). The species is likely to occur throughout sand dune and potentially suitable areas of sand plain habitat within the application area (Biologic, 2020). Suitable fauna habitats within the application area form part of a much larger extent and are well represented beyond the application area and within the region (Biologic, 2020; Newcrest, 2020a). The application area is unlikely to provide critical habitat which the northern marsupial mole is reliant upon, therefore the proposed clearing is unlikely to impact the conservation status of this species (Newcrest, 2020a).

Two conservation significant fauna species were considered likely to occur due to suitable habitat present and previous records of the species within 20 kilometres of the application area, including; great desert skink (*Liopholis kintorei*, VU at a federal level) and brush-tailed mulgara (*Dasyercus blythi*, P4). Two conservation significant fauna species were considered possibly occurring as residents within the application area due to suitable habitat present, including: night parrot (*Pezoporus occidentalis*, EN at a federal level) and princess parrot (*Polytelis alexandrae*, VU at a federal level, P4 at a state level) (Biologic, 2020). None of these species were recorded during the field survey and the application area is unlikely to represent habitat significant to any of these species (Biologic, 2020). The nearest record for night parrot or princess parrot is 170 kilometres from the application area, as such it is unlikely that the proposed clearing will have an impact on the conservation status of these species (Biologic, 2020).

There are 14 conservation significant bird species that are considered possibly occurring within the application area due to suitable foraging habitat, the majority of these birds are migratory species (Biologic, 2020). These species are considered to be infrequent visitors and none would be dependent on the application area for nesting or breeding habitat (Biologic, 2020). The proposed clearing is unlikely to provide habitat significant to any of these species as they are all highly mobile and have broad home ranges (Biologic, 2020).

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

**Methodology** Biologic (2020)  
DBCA (2020)  
Keighery (1994)  
Newcrest (2020a)  
Newcrest (2020b)

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). Flora surveys of the application area did not record any species of Threatened flora (Stratagen, 2020; Newcrest, 2020a).

The vegetation association within the application area is common and widespread within the region (Stratagen, 2020; 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** Newcrest (2020a)  
Stratagen (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 (Stratagen, 2020).

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

**Methodology** Stratagen (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 at variance to this Principle**

The application area falls within the Great Sandy Desert Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 99% of the pre-European vegetation still exists in the IBRA Great Sandy Desert Bioregion (Government of Western Australia, 2019). The application area is broadly mapped as Beard vegetation association 134: Mosaic: Hummock grasslands, open low tree steppe; desert bloodwood and feathertop spinifex on sandhills / Hummock grasslands, shrub steppe; mixed shrubs over spinifex between sandhills (GIS Database). Approximately 99% of the pre-European extent of vegetation association 134 remains uncleared at both the state and bioregional level (Government of Western Australia, 2019).

Therefore, the application area does not represent 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 – Great Sandy Desert	29,538,799	29,535,810	~99	Least Concern	3.46
Beard vegetation associations – WA					
134	26,026,864	26,022,995	~99	Least Concern	3.34
Beard vegetation associations – Great Sandy Desert Bioregion					
134	13,595,888	13,593,950	~99	Least Concern	4.97

\* Government of Western Australia (2019)

\*\* Department of Natural Resources and Environment (2002)

Based on the above, the proposed clearing is not at 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 is at variance to this Principle**

There are no permanent watercourses or wetlands within the area proposed to clear (Newcrest, 2020a; GIS Database). There are multiple non-perennial lakes within the application area (GIS Database). Rainfall discharges between sand dunes as sheet flow and accumulates into these clay pan lakes after heavy rainfall, where it temporarily ponds while it infiltrates and evaporates (Newcrest, 2020a). There is one vegetation type that is growing in association with these clay pans:

**6e:** Fringing vegetation associated with Clay Pans. Typical community consists of *Acacia stellaticeps* over *Triodia epactia* and *Triodia basedowii*.

*Eucalyptus victrix* is a groundwater dependant species and was recorded within one vegetation type within the application area (6i) as scattered trees (Newcrest, 2020a; Stratagen, 2020). However, this species is not growing in association with any wetland or watercourse within the application area (GIS Database).

Based on the above, the proposed clearing is at variance to this Principle. Potential impacts to vegetation

growing in association with watercourses may be minimised by the implementation of a watercourse management condition.

**Methodology** Newcrest (2020a)  
Stratagen (2020)

GIS Database:  
- Hydrography, Lakes  
- Hydrography, linear

**(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 application area is assumed to occur on landforms similar to those identified in the Little Sandy land system (DPIRD, 2020). The Little Sandy land system is described as having linear and reticulate dunes supporting shrubby hard and soft spinifex grasslands (DPIRD, 2020). Sandplains and swales act as corridors between dunes, comprised of minor gravelly plains and plains with thin sand over calcrete (DPIRD, 2020). The dune flats and crests are moderately to highly susceptible to wind erosion when native vegetation is cleared (DPIRD, 2020).

Based on the above, the proposed clearing may be at variance to this Principle. Potential land degradation impacts as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

**Methodology** DPIRD (2020)

**(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 Karlamilyi National Park which is located approximately 19.5 kilometres southeast 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). There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database). Rainfall accumulates into widespread clay pans and playa lakes after heavy rainfall, where it temporarily ponds until it either evaporates or infiltrates as groundwater recharge to the underlying aquifer (Newcrest, 2020a). The proposed clearing is unlikely to result in significant changes to surface water flows.

The proposed clearing is unlikely to cause deterioration in the quality of underground water.

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

**Methodology** Newcrest (2020a)

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 arid tropical with summer rainfall, with an annual average rainfall of approximately 350 millimetres per year (BoM, 2020a; CALM, 2002). The nearest weather station is Telfer Aero, approximately 40 kilometres west of the application area, with an average rainfall of approximately 364.2 millimetres per year

(BoM, 2020b; Newcrest, 2020a).

There are no permanent water courses or waterbodies within the application area (GIS Database). Water runoff discharges between westerly-trending sand dunes after heavy rainfall as sheet flow and accumulates into clay pans where it temporarily inundates before evaporation or infiltration (Newcrest, 2020a). Given the free draining nature of the soils within the application area it is unlikely that the proposed clearing will significantly exacerbate the incidence or intensity of natural flooding events (Newcrest, 2020a).

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

**Methodology** BoM (2020a)  
BoM (2020b)  
CALM (2002)  
Newcrest (2020a)

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 21 September 2020 by the Department of Mines, Industry Regulation and Safety (DMIRS), inviting submissions from the public. The clearing permit application was readvertised on 28 September 2020 due to a change in the permit type. No submissions were received in relation to this application.

There is one native title claim (WC1996/078) over the area under application (DPLH, 2020). This claim has been determined by the Federal Court on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There 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.

It is noted that the proposed clearing may impact on a protected matter under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The proponent may be required to refer the project to the (Federal) Department of Agriculture, Water and the Environment for environmental impact assessment under the EPBC Act. The proponent is advised to contact the Department of Agriculture, Water and the Environment for further information regarding notification and referral responsibilities under the EPBC Act.

**Methodology** DPLH (2020)

#### 4. References

- Biologic (2020) Havieron Project. Detailed Vertebrate and SRE Invertebrate Fauna Survey. Report prepared by Biologic Environmental Survey Pty Ltd, for Newcrest Mining Limited, September 2020.
- BoM (2020a) Bureau of Meteorology Website – Australian Climate Averages – Rainfall (Climatology 1981-2010). Bureau of Meteorology. [http://www.bom.gov.au/jsp/ncc/climate\\_averages/rainfall/index.jsp?period=an&area=wa#maps](http://www.bom.gov.au/jsp/ncc/climate_averages/rainfall/index.jsp?period=an&area=wa#maps) (Accessed 23 September 2020).
- BoM (2020b) Bureau of Meteorology Website – Climate Data Online, Telfer Aero. Bureau of Meteorology. <http://www.bom.gov.au/climate/data/> (Accessed 23 September 2020).
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.
- DBCA (2020) Advice received in relation to Clearing Permit Application CPS 9035/1. Species and Communities Branch, Department of Biodiversity, Conservation and Attractions, Western Australia, November 2020.
- DPIRD (2020) Advice received in relation to Clearing Permit Application CPS 9035/1. Commissioner of Soil and Land Conservation, Department of Primary Industries and Regional Development, Western Australia, November 2020.
- DPLH (2020) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. <http://maps.daa.wa.gov.au/AHIS/> (Accessed 22 September 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.
- Newcrest (2020a) Havieron Native Vegetation Clearing Permit Application. Havieron Project M45/1287. Prepared by Newcrest Mining Limited, September 2020.
- Newcrest (2020b) Havieron Project. Bilby Management Plan. Prepared by Newcrest Mining Limited, November 2020.
- Stratagen (2020) Newcrest Mining Ltd. Detailed Flora and Vegetation Survey Havieron Project Area. Report prepared by JBS&G Australia Pty Ltd, for Newcrest Mining Limited, August 2020.
- Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. <https://florabase.dpaw.wa.gov.au/> (Accessed 14 October 2020).

## 5. Glossary

### Acronyms:

<b>BC Act</b>	<i>Biodiversity Conservation Act 2016</i> , Western Australia
<b>BoM</b>	Bureau of Meteorology, Australian Government
<b>DAA</b>	Department of Aboriginal Affairs, Western Australia (now DPLH)
<b>DAFWA</b>	Department of Agriculture and Food, Western Australia (now DPIRD)
<b>DAWE</b>	Department of Agriculture, Water and the Environment, Australian Government
<b>DBCA</b>	Department of Biodiversity, Conservation and Attractions, Western Australia
<b>DEC</b>	Department of Environment and Conservation, Western Australia (now DBCA and DWER)
<b>DER</b>	Department of Environment Regulation, Western Australia (now DWER)
<b>DMIRS</b>	Department of Mines, Industry Regulation and Safety, Western Australia
<b>DMP</b>	Department of Mines and Petroleum, Western Australia (now DMIRS)
<b>DoE</b>	Department of the Environment, Australian Government (now DAWE)
<b>DoEE</b>	Department of the Environment and Energy (now DAWE)
<b>DoW</b>	Department of Water, Western Australia (now DWER)
<b>DPaW</b>	Department of Parks and Wildlife, Western Australia (now DBCA)
<b>DPIRD</b>	Department of Primary Industries and Regional Development, Western Australia
<b>DPLH</b>	Department of Planning, Lands and Heritage, Western Australia
<b>DRF</b>	Declared Rare Flora
<b>DSEWPaC</b>	Department of Sustainability, Environment, Water, Population and Communities (now DAWE)
<b>DWER</b>	Department of Water and Environmental Regulation, Western Australia
<b>EP Act</b>	<i>Environmental Protection Act 1986</i> , Western Australia
<b>EPA</b>	Environmental Protection Authority, Western Australia
<b>EPBC Act</b>	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
<b>GIS</b>	Geographical Information System
<b>ha</b>	Hectare (10,000 square metres)
<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
<b>PEC</b>	Priority Ecological Community, Western Australia
<b>RIWI Act</b>	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
<b>TEC</b>	Threatened Ecological Community

### Definitions:

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

#### **T** Threatened species:

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

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

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

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

#### **CR** Critically endangered species

Threatened species considered to be "facing an extremely high risk of extinction in the wild in the



*immediate future, as determined in accordance with criteria set out in the ministerial guidelines”.*

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

**EN Endangered species**

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

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

**VU Vulnerable species**

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

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

**Extinct Species:**

**EX Extinct species**

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

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

**EW Extinct in the wild species**

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

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

**Specially protected species:**

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

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

**MI Migratory species**

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

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

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

**CD Species of special conservation interest (conservation dependent fauna)**

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with

the ministerial guidelines (section 14 of the BC Act).

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

**OS**

**Other specially protected species**

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

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

**P**

**Priority species:**

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

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

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

**P1**

**Priority One - Poorly-known species**

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

**P2**

**Priority Two - Poorly-known species**

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

**P3**

**Priority Three - Poorly-known species**

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

**P4**

**Priority Four - Rare, Near Threatened and other species in need of monitoring**

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.