

1. Application details and outcomes

1.1. Permit application details

Permit number:	8152/4
Permit type:	Purpose Permit
Applicant name:	Avoca Mining Pty Ltd
Application received:	24 October 2022
Application area:	1,082.81 hectares
Purpose of clearing:	Mineral Production and Associated Activities
Method of clearing:	Mechanical Removal
Tenure:	General Purpose Leases 15/19, 15/26, 15/27, 15/29 Mining Leases 15/31, 15/231, 15/338, 15/348, 15/352, 15/375, 15/506, 15/507, 15/512, 15/528, 15/580, 15/581, 15/597, 15/610, 15/639, 15/640, 15/642, 15/665, 15/681, 15/748, 15/817, 15/1790, 15/1814 Miscellaneous Licences 15/347, 15/368, 15/382, 15/386, 15/389
Location (LGA area/s):	Shire of Coolgardie
Colloquial name:	Higginsville Gold Operations

1.2. Description of clearing activities

Avoca Mining Pty Ltd proposes to clear up to 1,082.81 hectares of native vegetation within a boundary of approximately 4,646.25 hectares, for the purposes of mineral production and associated activities. The project is located approximately 50 kilometres north of Norseman, within the Shire of Coolgardie.

The amendment application is to allow for expansion of mining operations.

Clearing permit CPS 8152/1 was granted by the Department of Mines, Industry Regulation and Safety on 4 October 2018 and was valid from 27 October 2018 to 31 July 2023. The permit authorised the clearing of up to 200 hectares of native vegetation within a boundary of approximately 1,694 hectares, for the purpose of mineral production and associated activities.

Clearing permit CPS 8152/1 was amended on 26 September 2019 for the purpose of increasing the area authorised to clear from 200 hectares to 270 hectares and increasing the permit boundary from 1,694 hectares to 1,789 hectares.

Clearing permit CPS 8152/2 was amended on 20 August 2020 for the purpose of increasing the amount of approved clearing, increasing the permit boundary, and amalgamating five pre-existing permits into one. Clearing permits CPS 6644/1, 7673/1, 7674/2, 8062/1 and 8152/2 were amalgamated into CPS 8152/3. The total combined approved clearing area under these permits was 1,190.66 hectares. Through the amendment the total disturbance footprint for the Higginsville Gold Operations was reduced from 1,190.66 hectares to 1,000 hectares.

On 24 October 2022, the Permit Holder applied to amend CPS 8152/3 to include additional tenure, extend the permit duration, and increase the amount of approved clearing and the permit boundary by 82.81 hectares.

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	23 March 2023
Decision area:	1,082.81 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 24 October 2022. DMIRS advertised the application for a public comment for a period of 21 days, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix A), relevant datasets (Appendix D), the clearing principles set out in Schedule 5 of the EP Act (**Error! Reference source not found.**), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3).

The assessment identified that the proposed clearing may result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values; and
- potential impacts to an ephemeral drainage line, and consequently on surface water flow.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to lead to have adverse impacts on the conservation of significant flora and fauna and the impacts of clearing can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds; and
- avoid impacts to riparian vegetation and maintain surface water flow.

1.5. Site map

A site map of proposed clearing is provided in Figure 1 below.



Figure 1. Map of the application area. The yellow area indicates the area within which conditional authorised clearing can occur under the previous granted clearing permit with the purple area being the proposed additional clearing area.

2. Legislative context

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

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

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

Other legislation of relevance for this assessment include:

CPS 8152/4

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Mining Act 1978* (WA)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2021)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2020)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

No evidence of avoidance or mitigation measures was provided to support the application.

3.2. Assessment of impacts on environmental values

The assessment against the clearing principles (see Appendix B) identified the impacts of the proposed clearing are limited and able to be managed to be environmentally acceptable with standard avoid and minimise, hygiene and watercourse management conditions.

A review of current environmental information (Appendix's A and B) reveals that the assessment against the clearing principles has not changed significantly from the Clearing Permit Decision Report CPS 8152/3.

3.2.1. Biological values (Principle a)

Assessment

Numerous flora and vegetation surveys have been conducted by Native Vegetation Solutions, including two reconnaissance surveys in 2017, a reconnaissance survey in 2018, and further two reconnaissance surveys in 2019 (Karora Resources, 2022; NVS 2017a; NVS 2017b; NVS 2018; NVS 2019a; NVS 2019b). A total of 136 flora species from 45 genera, and 23 families were recorded within the application area (Karora Resources, 2022). Two broad scale communities were recorded within the amendment area, these being:

- *Eucalyptus salmonophloia* woodland over sclerophyll shrubland: and
- *Eucalyptus salubris* over sclerophyll shrubland over *Tecticornia disarticulata*.

Three Priority species: *Calandrinia lefroyensis* (Priority 1), *Allocasuarina eriochlamys subsp. grossa* (Priority 3) and *Eremophila acutifolia* (Chinnock) R. Fowler (Priority 3), have been identified as potentially occurring within the amendment area (Karora Resources, 2022).

Calandrinia lefroyensis was recorded at one location that may have been cleared as approved under CPS 8152/1 for the Baloo haul road, assuming that the recorded location of this samphire community species is correct (RNC, 2020). The habitat description for *Calandrinia lefroyensis* is salt-lake flats among samphire communities on the outer edges of samphire communities including within the ecotone of adjacent communities (RNC, 2020). This habitat type occurs near the Baloo haul road as well as at two small areas intersected by the proposed Pioneer haul road. The Baloo haul road is already constructed so no further clearing is required. The Pioneer haul road was subject to a vegetation survey by an experienced goldfields senior botanist and no conservation listed flora were recorded (RNC, 2020).

Calandrinia lefroyensis has a range extending 140 kilometres north of Lake Cowan and has not been recorded in the relevant vegetation surveys conducted by NVS (NVS 2017a; NVS 2017b; NVS 2018; NVS 2019a; NVS 2019b). It is noted that the associated habitat (salt-lake flats among samphire communities) is not contained within the mining development footprint (with the exception of two small areas at the Pioneer haul road that were subject to flora survey and it as not recorded at these locations) (RNC, 2020). Based upon the above, it is unlikely that clearing within the amendment area will impact on the conservation status of *Calandrinia lefroyensis*.

Allocasuarina eriochlamys subsp. grossa has a known distribution from Salmon Gums (95 kilometres north of Esperance) and extending 230 kilometres north to near Coolgardie (Karora Resources, 2022; RNC, 2020). Two small populations have previously been recorded within the broader application area, however have not been identified within the amendment area (Karora Resources, 2022). Given its regional distribution and occurrence at only two locations in the broader application area, it is unlikely that clearing within the amendment area will impact on the overall conservation status of *Allocasuarina eriochlamys subsp. grossa*.

Eremophila acutifolia (Chinnock) R. Fowler (referred to in previous reports and formerly named as *Diocirea acutifolia*), was recorded at multiple locations within the broader application area, however was not been identified within the amendment area (Karora Resources, 2022; RNC, 2020). This species is widespread and in large numbers through the local and regional area and is well documented by previous flora surveys (Karora Resources, 2022; RNC, 2020). The Western Australian Herbarium (1998-) confirms that this species has been recorded in around the Coolgardie, Kambalda and Norseman area. Given this species is found outside of the application area in sufficient numbers, the proposed clearing is not likely to significantly impact on this species.

Nineteen introduced plant taxa were recorded in the broader application area (Jenny Borger Botanical Consulting, 2021). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and

making areas more fire prone. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Conclusion

Based on the above assessment, the increase in the area proposed to clear is unlikely to have impacts on the above Priority flora species. The proposal can be managed to be environmentally acceptable with avoid and minimise, and hygiene management conditions.

Conditions

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

- Maintain the weed management condition on the permit;
- Maintain the existing avoid, minimise etc. condition.

3.3. Relevant planning instruments and other matters

The clearing permit amendment application was advertised on 8 November 2022 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application.

There is one native title claim (WC 1999/002 – Ngadju Native Title Aboriginal Corporation) over the area under application (DPLH, 2023). 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, 2023). 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. Site characteristics

A.1. Site characteristics

Characteristic	Details
Local context	The project is located approximately 50 kilometres north of Norseman, within the Shire of Coolgardie in the extensive land use zone (GIS Database). The predominant land use in the region is grazing of native pastures, conservation and mining activity.
Ecological linkage & Conservation Areas	The nearest conservation area is the Binaronca Nature Reserve which is located approximately 2.6 kilometres north, north-west of the application area of the main project area, and 5.3 kilometres west, north-west from the amendment area (GIS Database). As the application area is part of an existing mine and is to allow for the expansion of mining activities, it is not considered to be an ecological linkage to other areas of vegetation.
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation associations:</p> <p>8: Medium woodland; salmon gum & gimlet; and 501: Medium woodland; goldfields blackbutt (GIS Database).</p> <p>Several flora and vegetation surveys have been conducted over the application area by Native Vegetation Solutions including two reconnaissance surveys 2017, a reconnaissance survey in 2018, and further two reconnaissance surveys in 2019 (Karora Resources, 2022; NVS 2017a; NVS 2017b; NVS 2018; NVS 2019a; NVS 2019b). The following vegetation associations were recorded within the application area (Karora Resources, 2022; Native Vegetation Solutions, 2018):</p> <ul style="list-style-type: none"> • <i>Eucalyptus torquata</i> woodland over mixed sclerophyll shrubland. • <i>Eucalyptus salmonophloia</i> woodland over sclerophyll shrubland. • <i>Eucalyptus salmonophloia</i> and <i>E. transcidentalis</i> woodland over <i>Eucalyptus yilgarnensis</i> over <i>Melaleuca sheathiana</i> over <i>Maireana sedifolia</i> and <i>Tecticornia disarticulata</i> shrubland. • Mixed <i>Eucalyptus</i> woodland over sclerophyll and chenopod shrubland. • <i>Eucalyptus lesouefii</i> and <i>E. salmonophloia</i> over chenopod shrubland. • <i>Eucalyptus griffithsii</i> woodland. • <i>Eucalyptus lesouefii</i> over <i>Melaleuca sheathiana</i> woodland. • <i>Eucalyptus oleosa</i> over <i>Melaleuca sheathiana</i> over sclerophyll shrubland. • <i>Eucalyptus salubris</i> over sclerophyll shrubland.
Vegetation condition	<p>The vegetation survey (Karora Resources, 2022) indicates the vegetation within the proposed clearing area is in Excellent to Completely Degraded (Trudgen, 1991) condition, described as</p> <ul style="list-style-type: none"> • Excellent - Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement. • Completely Degraded - Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs. <p>The full Trudgen (1991) condition rating scale is provided in Appendix C.</p>
Climate and landform	The broader application area is mapped within elevations of 300 – 340 meters AHD (GIS Database). The climate of the region is semi-arid, with an annual rainfall average of approximately 270 millimetres (BoM, 2023).
Soil description and Land degradation risk	The amendment area is located within the Kambalda Soil-Landscape Zone (Tille, 2006). This zone is characterised by flat to undulating plains (with hills, ranges and some salt lakes and stony plains) on greenstone and granitic rocks of the Yilgarn Craton (Tille, 2006). Soils comprise calcareous loamy earths and red loamy earths with salt lakes soils and some red/brown hardpan shallow loams and red sandy duplexes (Tille, 2006). A large part of the application area has been previously disturbed by mining and exploration activities.
Hydrogeography and Waterbodies	There are no permanent waterbodies or watercourses within the application area, however, there are several minor non-perennial watercourse present (GIS Database). There are no Public Drinking Water Source Areas within or in close proximity to the amendment area (GIS Database).
Flora	Three Priority species: <i>Calandrinia lefroyensis</i> (Priority 1), <i>Allocasuarina eriochlamys subsp. grossa</i> (Priority 3) and <i>Eremophila acutifolia</i> (Chinnoek) R. Fowler (Priority 3), have been identified as potentially occurring within the amendment area (Karora Resources, 2022).
Ecological communities	There are no mapped Threatened or Priority Ecological Communities (TEC/PEC) within the application area or within a 10 kilometres radius (GIS Database).

Characteristic	Details
Fauna	No conservation significant fauna species have previously been recorded within the broader application area (GIS Database). Terrestrial Ecosystems (2019) conducted a fauna survey over the application area in August 2019 and determined that proposed clearing activities are unlikely to have a significant impact on any conservation significant species.

A.2. Flora analysis table

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

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Calandrinia lefroyensis</i>	Priority 1	Y	Y	Y	Within broader application area (outside amendment area)	10 populations	
<i>Allocasuarina eriochlamys</i> subsp. <i>grossa</i>	Priority 3	Y	Y	Y	Within broader application area (outside amendment area)	28 populations	Y
<i>Eremophila acutifolia</i> (Chinnock) R.Fowler (formerly <i>Diocirea acutifolia</i>)	Priority 3	Y	Y	Y	Within broader application area (outside amendment area)	20 populations	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>Numerous flora and vegetation surveys have been conducted by Native Vegetation Solutions, including two reconnaissance surveys in 2017, a reconnaissance survey in 2018, and further two reconnaissance surveys in 2019 (Karora Resources, 2022; NVS 2017a; NVS 2017b; NVS 2018; NVS 2019a; NVS 2019b). A total of 136 flora species from 45 genera, and 23 families were recorded within the application area (Karora Resources, 2022).</p> <p>There are no known Threatened flora, Threatened or Priority Ecological Communities within the permit area (Karora Resources, 2022; GIS Database). No Priority flora have been recorded within the amendment area, however three Priority flora species have been identified as potentially occurring (Karora Resources, 2022).</p> <p>Nineteen weed species were recorded within the broader application area during the flora survey (Jenny Borger Botanical Consulting, 2021). Three Declared Pests sectioned under the <i>Biosecurity and Agriculture Management Act 2007</i> or Weeds of National Significance were recorded within the application area (Jenny Borger Botanical Consulting, 2021). Potential impacts to biodiversity as a result of the</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p>proposed clearing may be minimised by the implementation of a weed management condition.</p> <p>No conservation significant fauna have been recorded within the amendment area (Terrestrial Ecosystems, 2019; GIS Database).</p>		
<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 does not contain significant habitat for conservation significant fauna.</p>	Not likely to be at variance	No
<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>There are no known records of Threatened flora within the application area (GIS Database). A flora survey of the application area did not record any species of Threatened flora (Karora Resources, 2022).</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>There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the application area (GIS Database).</p> <p>A flora and vegetation survey of the application area did not identify any TECs (Karora Resources, 2022).</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 amendment area falls within the Coolgardie Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 98% of the pre-European vegetation still exists in the IBRA Coolgardie Bioregion (Government of Western Australia, 2019).</p> <p>The broader application area is broadly mapped as Beard vegetation associations 8: Medium woodland; salmon gum & gimlet; and 501: Medium woodland; goldfields blackbutt (GIS Database). Approximately 50% of the pre-European extent of Beard vegetation association 8 remains uncleared at the state level and approximately 98% at the bioregional level (Government of Western Australia, 2019). Approximately 99% of the pre-European extent of Beard vegetation association 501 remains uncleared at both the state and bioregional level (Government of Western Australia, 2019). The permit area does not contain any remnants nor does it form part of any remnants in the local area (GIS Database).</p>	Not 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> <p><u>Assessment:</u></p> <p>There are no conservation areas in the vicinity of the application area. The nearest DBCA managed land is the Binaronca Nature Reserve which is located approximately 2.6 kilometres north, north-west of the application area of the main project area, and 5.3 kilometres west, north-west from the amendment area (GIS Database). The proposed clearing is unlikely to impact on the environmental values of any conservation area.</p>	Not likely to be at variance	No
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>	At variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
<p>The amendment area has two minor ephemeral drainage lines (GIS Database). Drainage lines within the application area are poorly defined and are only likely to flow following major rainfall events. As the vegetation associated with this ephemeral drainage line may be cleared, it is recommended to maintain surface water flow or reinstate downstream into existing natural drainage lines.</p> <p>Potential impacts to watercourses may be managed through the continuous implementation of a vegetation management condition, which includes avoiding clearing riparian vegetation and maintaining surface water flow.</p>		
<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 amendment area is located within the Kambalda Soil-Landscape Zone (Tille, 2006). This zone is characterised by flat to undulating plains (with hills, ranges and some salt lakes and stony plains) on greenstone and granitic rocks of the Yilgarn Craton (Tille, 2006). Soils comprise calcareous loamy earths and red loamy earths with salt lakes soils and some red/brown hardpan shallow loams and red sandy duplexes (Tille, 2006).</p> <p>The amendment proposal to clear 1082.81 hectares of native vegetation is considered to be a relatively large area and may lead to land degradation through soil erosion. According to Northcote et al (1960 -1968), the application area is within an area of sandy soils which can be susceptible to wind erosion. Although typical surface runoff would be minimal given the climate (BoM, 2023), high rainfall events may cause short-term erosion through the transportation of sediments in surface flows. Potential impacts from land degradation as a result of the proposed clearing may be minimised by maintaining the staged clearing condition on the permit.</p>	May be at variance	No
<p><u>Principle (i):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</i></p> <p><u>Assessment:</u></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 area proposed to clear (GIS Database). Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall. The proposed amendment is unlikely to result in significant changes to surface water flows.</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>The climate of the region is semi-arid, with a low average rainfall of approximately 270 millimetres per year (BoM, 2023).</p> <p>There are no permanent water courses 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 C. Vegetation condition rating scale

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

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Trudgen, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.

Measuring vegetation condition for the Eremaean and Northern Botanical Provinces (Trudgen, 1991)

Condition	Description
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Very poor	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

Appendix D. Sources of information

D.1. GIS databases

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

- 10 Metre 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)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Pre-European Vegetation Statistics
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- Soil Landscape Mapping – Rangelands (DPIRD-064)
- WA Now Aerial Imagery

Restricted GIS Databases used:

- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

D.2. References

- BoM (2023) Bureau of Meteorology Website – Climate Data Online, Weather Station Name. Bureau of Meteorology. http://www.bom.gov.au/climate/averages/tables/cw_012018.shtml (Accessed 30 January 2023).
- DPLH (2023) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. <http://maps.daa.wa.gov.au/AHIS/> (Accessed 30 January 2023).
- 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.
- Jenny Borger Botanical Consulting (2021) Weed survey of disturbance areas at the Higginsville Minesite and surrounding areas. Unpublished report prepared for Karora Resources, by Jenny Borger Botanical Consulting, June 2021.
- Karora Resources (2022) Supporting Information for an Application to Amend CPS 8152/3 (8152/4) Higginsville Gold Operation. Unpublished report prepared by Karoroa Resources, October 2022.

- Native Vegetation Solutions (2017a) Level 1 Flora and Vegetation Survey of the Mitchell Project Area, Higginsville (M15/338, M15/639, M15/640, M15/1790 and G15/29). Report prepared for Avoca Mining Pty Ltd by Native Vegetation Solutions, June 2017.
- Native Vegetation Solutions (2017b) Level 1 Flora and Vegetation Survey of the Two Boys and Fairplay Project area, and Proposed Infrastructure Corridors Development Higginsville (M15/348, M15/352, M15/375, M15/512, M15/528, M15/610, M15/642 and P15/5429). Report prepared for Avoca Mining Pty Ltd by Native Vegetation Solutions, July 2017.
- Native Vegetation Solutions (2018) Reconnaissance Flora and Vegetation Survey of the Eundynie Gold Project, Higginsville. Report prepared for Avoca Mining Pty Ltd by Native Vegetation Solutions, January 2018.
- Native Vegetation Solutions (2019a) Reconnaissance Flora and Vegetation Survey of the Pioneer Gold Project, Higginsville. Report prepared for Avoca Mining Pty Ltd by Native Vegetation Solutions, July 2019.
- Native Vegetation Solutions (2019b) Reconnaissance Flora and Vegetation Survey of the Eundynie Gold Project. Report prepared for Avoca Mining Pty Ltd by Native Vegetation Solutions, June 2019.
- 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.
- RNC (2020) Supporting Information for an Application to Amend CPS 8152/2 Higginsville Gold Operations. Unpublished report prepared by RNC Minerals, May 2020.
- Terrestrial Ecosystems (2019) Level 1 Vertebrate Fauna Risk Assessment for the Eundynie Project. Unpublished report prepared for Native Vegetation Solutions on behalf of RNC Minerals Limited by Terrestrial Ecosystems, Version 1, July 2019.
- Tille. P. (2006) Soil-landscapes of Western Australia's Rangelands and Arid Interior. Technical Report 313. Department of Agriculture and Food, Western Australia. ISSN 1039-7205.
- Trudgen, M.E. (1991) Vegetation condition scale in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.
- Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed 30 January 2023).

4. Glossary

Acronyms:

BC Act	<i>Biodiversity Conservation Act 2016, Western Australia</i>
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, Western Australia</i>
EPA	Environmental Protection Authority, Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)</i>
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, Western Australia</i>
TEC	Threatened Ecological Community

Definitions:

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

T **Threatened species:**

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

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

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

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

CR Critically endangered species

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

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

EN Endangered species

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

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

VU Vulnerable species

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

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

Extinct Species:

EX Extinct species

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

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

EW Extinct in the wild species

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

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

Specially protected species:

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

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

MI Migratory species

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

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

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

CD Species of special conservation interest (conservation dependent fauna)

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

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

OS Other specially protected species

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

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

P Priority species:

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

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

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

P1 Priority One - Poorly-known species

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

P2 Priority Two - Poorly-known species

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

P3 Priority Three - Poorly-known species

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

P4 Priority Four - Rare, Near Threatened and other species in need of monitoring

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

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

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

Principles for clearing native vegetation:

- (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.
- (b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.
- (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.
- (d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.
- (e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.
- (f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
- (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
- (h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.
- (i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.
- (j) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.