



Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	9575/1
Permit type:	Purpose Permit
Applicant name:	Northern Star (South Kalgoorlie) Pty Ltd
Application received:	01 February 2022
Application area:	29 hectares
Purpose of clearing:	Tailings storage facility (TSF)
Method of clearing:	Mechanical Removal
Tenure:	Mining Lease 15/456
Location (LGA area/s):	Shire of Coolgardie
Colloquial name:	Samphire TSF

1.2. Description of clearing activities

Northern Star (South Kalgoorlie) Pty Ltd (Northern Star) proposes to clear up to 29 hectares of native vegetation within a boundary of approximately 29 hectares, for the purpose of a Tailings Storage Facility.

The application is to allow for the construction of a 'paddock style' tailings storage facility (TSF). The area proposed to be cleared is the immediate surrounds of the existing Samphire in-pit tailings storage facility at the South Kalgoorlie Operations (SKO) (Northern Star, 2022).

In addition to this clearing application, clearing Permit CPS 9551/1, for the portion of the Project that is located on freehold land (EEL53), is currently under assessment by the Department of Water and Environmental Regulation.

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	31 March 2022
Decision area:	29 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 01 February 2022. DMIRS advertised the application for 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), supporting information provided by the applicant (Appendix D), the clearing principles set out in Schedule 5 of the EP Act (Appendix B), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3).

The assessment identified that the proposed clearing may result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values; and
- the potential for water and/or wind erosion.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing can be 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
- commence construction no later than three months after undertaking clearing to reduce the risk of erosion.

2. Legislative context

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

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

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

Other legislation of relevance for this assessment include:

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

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

The proposed clearing area includes the immediate surrounds of the existing Samphire in-pit TSF. Clearing will be kept to the minimum extent necessary to minimise any potential environmental impacts of the project. Topsoil will be stripped and stockpiled for later re-use during rehabilitation activities (Northern Star, 2022).

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values, where practicable.

3.2. Assessment of impacts on environmental values

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

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

3.2.1. Biological values - Clearing Principles (a)

Assessment

The application area is located in the Coolgardie IBRA bioregion and the Eastern Goldfields IBRA subregion. The flora of the Eastern Goldfields subregion is moderately diverse, with 1,613 recorded native vascular species (GHD, 2016).

GHD completed a level 1 flora and fauna survey in November 2016. The survey was reviewed in January 2022 by Botanica Consulting. The survey covered the entirety of mining lease 15/456, which includes an area of approximately 433 hectares. The application area is 29 hectares and sits in the northern portion of the mining lease, which is abutting the current tailings storage facility. The flora survey identified 83 native flora taxa occurring within the survey area. Desktop searches identified that 43 conservation significant flora taxa have previously been recorded within 40 km of the survey area. However, no Threatened or Priority flora were recorded within the survey area or application area during the field survey (GHD, 2016; Botanica, 2022).

Four broad vegetation types were identified during the field survey. These are described in section A.1. Only two vegetation types occur within the application area and are in good to very good condition (Botanica, 2022). The vegetation types that occur within the application area were well represented within the survey area and in the general region (GHD, 2016). In addition, no vegetation communities within the application area have been identified as being a Threatened or Priority Ecological community (GHD, 2016; Botanica, 2022).

Six introduced flora taxa were recorded within the survey area during the field survey and were recorded around the current tailings storage facility. All of the taxa are considered environmental weeds and have previously been recorded in the Coolgardie IBRA bioregion (GHD, 2016). Weeds have the potential to out-compete native flora and reduce the biodiversity of an area. Potential impacts to biodiversity as a result of the introduction of weeds may be minimised by the implementation of a weed management condition.

A level 1 fauna survey was undertaken within mining lease 15/456. From the desktop assessment, 317 native fauna taxa were recorded within a 40 km radius of the survey area (GHD, 2016). 47 fauna taxa, including 39 birds, 4 mammals and 5 reptiles were recorded during the field survey (GHD, 2016). Four conservation significant species were identified as likely to occur within the survey area. These are listed in section A.1. No conservation significant fauna were encountered during the field survey. The species recorded in the survey area have been previously been recorded in the Coolgardie IBRA bioregion and are not considered to be dependent on the resources in the survey area.

One old Malleefowl mound was recorded in the southern portion of the survey area (not within the application area), however, it appeared long unused. There was no other evidence of Malleefowl within the survey area (GHD, 2016).

No known Threatened or Priority Ecological Communities (TEC/PECs) fall within, or in the vicinity of, the application area (GIS Database).

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on habitat for Priority flora is not likely to be significant. There is a high likelihood of weeds being present within the application area and the proposed clearing has the potential to exacerbate the spread of weeds.

Conditions

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

3.2.2. take hygiene steps to minimise the risk of the introduction and spread of weeds Biological values (fauna) - Clearing Principles (b)

Assessment

The four broad vegetation types that were identified from the field survey, broadly aligned with the Coolgardie IBRA region vegetation associations. The vegetation types identified in the field survey were in good to excellent condition, excluding the vegetation within and surrounding the current In-Pit TSF, which were noted as degraded/previously cleared (GHD, 2016). Of the four vegetation types, two are found in the application area only. These include:

- Mixed Eucalypt woodland (EW)
- Tecticornia open shrubland (TS)

These habitat types are well represented in the local and broader area and there is direct connectivity from the application area to surrounding habitats. Furthermore, given that the proposed clearing area has previously been disturbed, it is not likely to have a significant impact at a local or regional level.

No fauna species of conservation significance were recorded within the survey area during the field survey. However, evidence of a Malleefowl (*Leipoa ocellata*) mound was recorded in the survey area. A further three conservation significant fauna species are considered likely to occur within the application area, due to suitable breeding and foraging habitat. The three conservation significant fauna that are considered possible to occur within the application area are

- Peregrine Falcon (*Falco peregrinus*)
- Chuditch (*Dasyurus geoffroii*)
- Central Long-eared Bat (*Nyctophilus major tor*)

Whilst these species may opportunistically utilise the application area for foraging and/or breeding, they are unlikely to be dependent on the area, given the availability of similar and better quality habitat in the immediate surrounds.

As mentioned above, one old Malleefowl mound was recorded in the southern portion of the survey area (not within the application area), however, it appeared long unused. There was no other evidence of Malleefowl presence within the survey. The habitat value to this species within the application area is considered low (GHD, 2016).

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing of fauna habitat within the application area is not likely to have a significant impact to fauna species in the local area.

Conditions

No specific fauna management conditions are required on the permit to address impacts to fauna.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 11 February 2022 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application.

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

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.

Other relevant authorisations required for the proposed land use include:

- A Mining Proposal / Mine Closure Plan issued under *Mining Act 1978*.

End

Appendix A. Site characteristics

A.1. Site characteristics

Characteristic	Details
Local context	The application area is located approximately 35 kilometres south of Kalgoorlie-Boulder. The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. The proposed clearing is located in the immediate surrounds of the existing Sapphire in-pit tailings storage facility, which is part of Northern Star's South Kalgoorlie Operations (SKO).
Ecological linkage	According to available databases, the application area does not contain any known or mapped ecological linkages.
Conservation areas	According to available databases, the application area is not in any registered conservation area. The nearest conservation area (Kambalda Nature Reserve) is approximately 7.5 kilometres South of the application area.
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation associations (GIS Database):</p> <p>9: Medium woodland; coral gum (<i>Eucalyptus torquata</i>) & goldfields blackbutt (<i>E.lesouefii</i>) 468: Coolgardie; Medium woodland; salmon gum & goldfields blackbutt</p> <p>A flora and vegetation survey was conducted over the application area by GHD during November, 2016 and was reviewed by Botanica Consulting Pty Ltd during January, 2022. The survey area covered the entire extent of mining lease 15/456. The following vegetation types were recorded within the survey area, (Northern Star Resources Limited, 2022):</p> <p>Mixed Eucalyptus woodland (EW): <i>Eucalyptus lesouefii</i>, <i>E. salmonophloia</i>, <i>E. transcontinentalis</i>, <i>E. salubris</i> low to mid- woodland over <i>Melaleuca sheathiana</i>, <i>Exocarpos aphyllus</i> tall sparse shrubland over <i>Eremophila</i> spp. mid-sparse shrubland over <i>Senna artemisioides</i> subsp. <i>filifolia</i>, <i>Maireana</i> spp., <i>Sclerolaena</i> spp., <i>Scaevola spinescens</i>, <i>Olearia muelleri</i> low open shrubland with <i>Austrostipa elegantissima</i> isolated tussock grasses.</p> <p>Casuarina pauper open woodland (CpW): <i>Casuarina pauper</i>, <i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> low open woodland over <i>Dodonaea lobulata</i>, <i>Acacia colletioides</i>, <i>Eremophila oldfieldii</i> subsp. <i>angustifolia</i> mid- open shrubland over <i>Scaevola spinescens</i>, <i>Ptilotus obovatus</i>, <i>Acacia erinacea</i> low sparse shrubland.</p> <p>Melaleuca open shrubland (MS): <i>Melaleuca sheathiana</i> tall open shrubland with emergent <i>Eucalyptus oleosa</i> subsp. <i>oleosa</i> over <i>Tecticornia</i>, <i>Maireana villosa</i>, <i>Sclerolaena diacantha</i>, <i>Ptilotus obovatus</i> low sparse shrubland with <i>Austrostipa elegantissima</i> isolated tussock grasses.</p> <p>Tecticornia open shrubland (TS): <i>Tecticornia halocnemoides</i>, <i>Disphyma crassifolium</i>, <i>Maireana tomentosa</i> low open shrubland with <i>Austrostipa elegantissima</i> isolated tussock grasses.</p> <p>Highly Disturbed (HD): Previously cleared vegetation (existing TSF).</p> <p>Vegetation types EW, TS and HD were found within the application area only.</p>
Vegetation condition	<p>The vegetation survey conducted by GHD (2016) and survey review by Botanica (2022) indicate the vegetation within the proposed clearing area is in Excellent to Good (Keighery, 1994) condition, with all highly degraded/cleared areas (existing TSF) rated as Completely Degraded.</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix C.</p>
Climate and landform	The mapped elevation of the application area is approximately 350 metres AHD. The annual average rainfall (Kalgoorlie-Boulder) is 265.5 millimetres (BoM, 2022).
Soil description	The application area is within the soil landscape system zone 265 (Kambalda Zone) (DPIRD, 2022). The soil is further mapped as BB5 and My154 (DPIRD, 2022). Soil type BB5 is described as rocky ranges and hills of greenstones-basic igneous rock and soil type My154 is described as undulating country on acid volcanic rocks and sedimentary material (DPIRD, 2022).
Land systems	The application area has been mapped as the Coolgardie land system and the Eastern Goldfields subregion, as defined by the Interim Biogeographic Regionalisation for Australia (IBRA) classification system (McKenzie, 2003). The Eastern Goldfields subregion comprises gently undulating plains interrupted in the west by low hills and ridges of Archaean greenstones and in the east by a horst of Proterozoic basic

Characteristic	Details
	granulite. The underlying strata are eroded flat and covered with Tertiary sand and gravel soils, scattered exposures of bedrock, and plains of calcareous earths (Cowan, 2001).
Waterbodies	According to available databases, there are no permanent drainage channels or wetlands within the application area or in the vicinity of the application area (GIS Database).
Hydrogeography	The application area is within the Goldfields proclaimed groundwater area under the <i>Rights In Water and Irrigation Act 1914</i> (GIS Database). Groundwater salinity ranges between 14,000 to 35,000 milligrams per litre total dissolved solids (GIS Database).
Flora	<p>According to available databases, no Threatened or Priority Flora were identified within the Assessment Area (GIS Database)</p> <p>A level 1 flora survey was conducted by GHD in November 2016. From the desktop searches, 43 conservation significant flora taxa were recorded within 40 kilometres of the application area (GHD, 2016). No Threatened or Priority Flora taxa were identified within the application area during the field survey (Northern Star, 2022).</p>
Ecological communities	There are no known threatened or priority ecological communities (TEC/PECs) within the application area, or within 40 kilometre radius of the application area.
Fauna	<p>According to available databases, there have been no recordings of threatened or priority fauna within the application area (GIS Database). There has been one record of <i>Leipoa ocellata</i> (Malleefowl) (VU) and one record of <i>Dasyurus geoffroyi</i> (Chuditch) (VU) approximately 20 kilometres from the application area (GIS Database).</p> <p>A total of 317 vertebrate native fauna taxa were recorded within a 40 kilometre radius of the survey area during the fauna survey desktop assessment. These include six amphibian, 178 birds, 33 mammals and 100 reptiles (GHD, 2016). Of these, four conservation significant fauna were considered likely or known to occur within the application area and surrounds including Malleefowl (<i>Leipoa ocellata</i>), Peregrine Falcon (<i>Falco perenginus</i>), Chuditch (<i>Dasyurus geoffroyi</i>) and the Central Long-eared Bat (<i>Nyctophilus major tor</i>).</p> <p>No conservation significant fauna were recorded during the field survey (GHD, 2016; Botanica, 2022)</p> <p>One inactive Malleefowl mound was recorded approximately 3 kilometres south of the application area during the field survey.</p>

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>The area proposed to be cleared does not contain conservation significant flora, fauna or assemblages of plants. Conservation significant flora are unlikely to occur within the application area. The EW and TS vegetation types have the potential to provide foraging and breeding habitat for conservation significant fauna (GHD, 2016), however, no evidence of conservation significant fauna was observed during the field survey.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> “Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.”</p> <p><u>Assessment:</u></p> <p>There are two vegetation types within the application area that have the potential to provide foraging and breeding habitats for four conservation</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.2, above.</i>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p>significant fauna (Malleefowl, Chuditch, Peregrine Falcon, Central Long-eared Bat), however, there was no evidence of these species occurring within the application area during the field survey (GHD, 2016).</p> <p>Historical evidence of the Malleefowl (<i>Leipoa ocellata</i>) was recorded, with one inactive Malleefowl mound identified during the field survey (GHD, 2016; Botanica, 2022).</p>		
<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 survey area (GIS Database). No Threatened Flora were identified during the field survey (GHD, 2016; Botanica, 2022). The vegetation proposed to be cleared is unlikely to be necessary for the continued existence of any species of Threatened (rare) flora.</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared does not contain any known threatened ecological communities (TEC’s). There are no known TEC’s within a 40 kilometre radius of the application area (GIS Database; GHD, 2016; Botanica, 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 application area falls within the Coolgardie Bioregion of the Interim Biogeographic Regionalisation for Australia (GIS Database). Approximately 97.96% of the pre-European vegetation still exists in the Coolgardie Bioregion (Government of Western Australia, 2019). The application area is broadly mapped as Beard vegetation associations 468 and 9 (GIS Database). These vegetation associations have not been extensively cleared, as over 96% of the pre-European extent of these vegetation associations remains uncleared, at both the state and bioregional level (Government of Western Australia, 2019). The application area does not contain any remnants of native vegetation, nor does it form part of any remnants in the local area.</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 within the application area. The nearest conservation area is approximately 7.5 kilometres south of the application area. Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.</p>	Not likely to be at variance	No
Environmental value: land and water resources		

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>Given no permanent or ephemeral watercourses or wetlands are recorded within the application area, the proposed clearing is unlikely to impact an environment associated with a watercourse or wetland.</p>	Not likely to be at variance	No
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The application area lies within the Coolgardie Land system (GIS Database). The Coolgardie Land System is described as uplands and undulating plains associated with ultramafic greenstones supporting eucalypt woodlands and halophytic shrublands (DPIRD, 2022). Where not protected by a stony mantle, footslopes and valley floors are susceptible to water erosion, particularly in areas where perennial shrub cover is substantially reduced and/or the soil surface is disturbed (DPIRD, 2022). The risk of erosion can be minimised with the use of a staged clearing condition.</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). The proposed clearing is unlikely to result in significant changes to surface water flows or cause deterioration in the quality of underground water.</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 described as semi-arid with an average annual rainfall of 265.5 millimetres per year (BoM, 2022).</p> <p>Given no water courses or wetlands are recorded within, or in the vicinity of, the application area, the proposed clearing is unlikely to contribute to waterlogging.</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 Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

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

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.

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

Appendix D. Sources of information

D.1. GIS databases

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

- Aboriginal Heritage Places (DPLH-001)
- Contours (DPIRD-073)
- Clearing Regulations – Schedule One Areas (DWER-057)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Environmentally Sensitive Areas (DWER-046)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Native Title (ILUA) (LGATE-067)
- Pre-European Vegetation Statistics
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- 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 (2022) Bureau of Meteorology Website – Climate Data Online, Kalgoorlie Boulder. Bureau of Meteorology. <http://www.bom.gov.au/climate/data/> (Accessed 21 March 2022).
- Botanica (2022) Samphire Project – Environmental Assessment M15/456. Report prepared for Northern Star Resources Ltd, by Botanica Consulting, January 2022.
- Cowan (2001). A Biodiversity Audit of Western Australia's 53 Biogeographical Region in 2001- Coolgardie Region (COO3 Eastern Goldfields), Department of Conservation and Land Management.
- Department of Planning, Lands and Heritage (DPLH) (2022) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. <https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS> (Accessed 23 March 2022).
- Department of Primary Industries and Regional Development (DPIRD) (2022) NRInfo Digital Mapping. Department of Primary Industries and Regional Development. Government of Western Australia. URL: <https://maps.agric.wa.gov.au/nrm-info/> (21 March 2022).
- GHD (2016) Metals X Limited – Samphire Clearing Permit Area Flora and Fauna Assessment. Reported prepared for Northern Star Resources Ltd, by GHD, November 2016.
- 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. <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.

McKenzie, N.L., May J.E. and McKenna, S. (2002). Bioregional Summary of the 2002 Biodiversity Audit for Western Australia. Northern Star (2022) Clearing Permit Supporting Document – Samphire TSF. Report prepared by Northern Star Resource Ltd, January 2022.

4. Glossary

Acronyms:

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

Definitions:

{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.