



Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	9385/1
Permit type:	Purpose Permit
Applicant name:	Darryl John Mallett and Gina Stacey Mallett
Application received:	10 August 2021
Application area:	48.38 hectares
Purpose of clearing:	Mineral production and associated activities
Method of clearing:	Mechanical Removal
Tenure:	Mining Lease 46/524 Miscellaneous Licence 46/113
Location (LGA area/s):	Shire of East Pilbara
Colloquial name:	Five Mile Creek

1.2. Description of clearing activities

Darryl John Mallett and Gina Stacey Mallett propose to clear up to 48.38 hectares of native vegetation within a boundary of approximately 55.63 hectares, for the purpose of mineral production and associated activities.

The application is to allow for the mining and screening of sand from Five Mile Creek for construction purposes.

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	18 February 2022
Decision area:	48.38 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 10 August 2021. 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 E), supporting information provided by the applicant including the results of a flora and vegetation survey (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 Delegated Officer also took into consideration that there was a clearing permit previously granted on these mining tenements (CPS 8707/1) for sand mining but could not be transferred to the applicants when they purchased the tenements as it was a purpose permit.

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;
- impacts to conservation significant flora;
- impacts to conservation significant fauna;
- localised erosion if large trees stabilising the bed and banks of the river bed are removed; and
- deterioration of surface water quality, as a result of erosion and increased sedimentation.

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 poses some risks to fauna, land and water resources however, these risks can be adequately managed with conditions to ensure the proposal is environmentally acceptable.

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

- avoid, minimise to reduce the impacts and extent of clearing;

- take hygiene steps to minimise the risk of the introduction and spread of weeds;
- commence construction no later than three months after undertaking clearing to reduce the risk of erosion;
- avoid impacts to riparian vegetation and maintain surface water flow;
- retain trees greater than two metres in height within the creekbed which may provide habitat for fauna and also help reduce the risk of erosion.

1.5. Site map

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

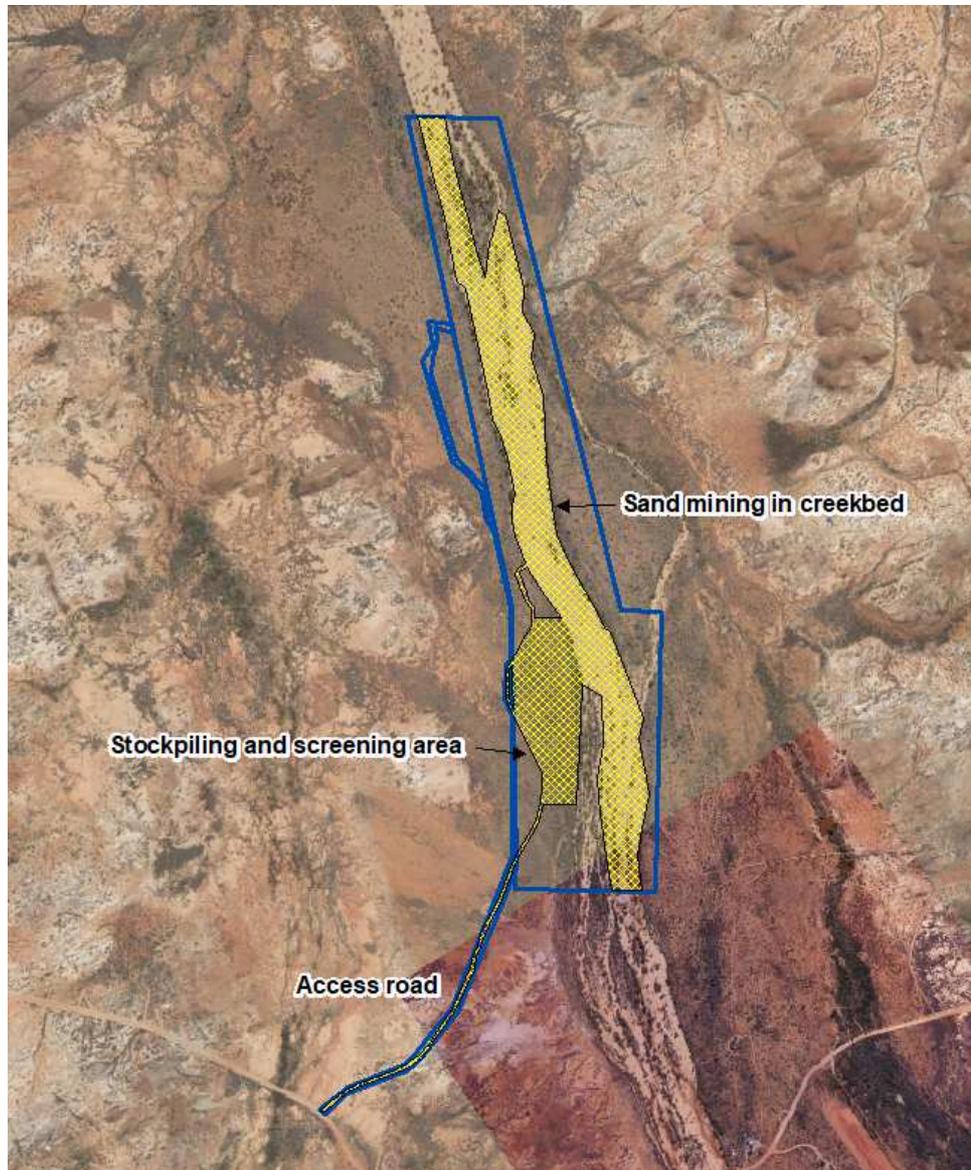


Figure 1. Map of the application area. The yellow area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.

2. Legislative context

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

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

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

Other legislation of relevance for this assessment includes:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Country Areas Water Supply Act 1947* (WA) (CAWS 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 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. The applicant has committed to avoiding clearing of large trees within the creekbed of Five Mile Creek and avoiding clearing riparian vegetation on the banks of the creek (apart from access ramps) in order to minimise the risk of erosion and on fauna habitat.

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 identified that the impacts of the proposed clearing present a risk to biological values (fauna, flora and vegetation), land and water resources. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (flora) - Clearing Principles (a) and (c)

Assessment

No flora or vegetation surveys have been conducted over the application area. A flora survey was undertaken over the mining tenements directly adjacent to the south of the application area by Waters and Chalwell in 2017. Vegetation mapping has been extrapolated from this survey to identify vegetation associations which are likely to be present within the application area. The vegetation associations likely to be within the application area are common and widespread within the region, with the exception of vegetation association SSCG which represents a Priority Ecological Community (PEC). This vegetation association was considered to represent the 'stony saline plains of the Mosquito land system' (Priority 3) which is described as "*Triodia longiceps* perennial grasslands with scattered *Maireana melanocoma* and *Sclerolaena* species and includes Priority flora taxa *Atriplex spinulosa* (P1) and *Ptilotus wilsonii* (P1) dissected by drainage lines. Dominated by (but not limited to) *Melaleuca eleuterostachya* and *Acacia bivenosa* occurring on saline red brown non-cracking clays with a mantle of quartz gravel and neutral subsurface soil material on level to undulating plains" (DBCA, 2020). It is unlikely that the proposed clearing will significantly impact the PEC as there is only a small portion of the proposed access road which intersects the PEC and the PEC is estimated to cover an area of approximately 46,000 hectares (Waters, 2017).

There were no flora and vegetation surveys conducted within the application area, however a flora survey conducted over adjacent areas recorded a total of 139 flora species (Waters, 2017). A desktop assessment of the application area identified 273 flora species, including ten conservation significant flora species, occurring within 20 kilometres of the application area (Drilline Civil and Haulage, 2021). Three Priority flora species were identified as possibly occurring within the application area based on preferred habitat, including; *Acacia fecunda* (Priority 1), *Eucalyptus rowleyi* (Priority 3) and *Goodenia nuda* (Priority 4) (Drilline Civil and Haulage, 2021).

Acacia fecunda is restricted to the Pilbara bioregion where it is known from a few distinct populations east of Nullagine and another population approximately 250 kilometres to the west near Millstream-Chichester National Park (Western Australian Herbarium, 1998-). The survey of adjacent mining tenements by Waters and Chalwell (2017) found this species across most of the Mosquito land system however, only to the east of Five Mile Creek. It was common in minor/intermediate drainage channels (tending to form monocultures on minor drainage lines and is often the dominant shrub in other areas) but was not recorded in any of the major drainage channels in the Mosquito land system (Waters and Chalwell, 2017). There were no records of this species within the sites surveyed in Five Mile Creek (Waters and Chalwell, 2017). Based on the results of this survey, major drainage lines such as Five Mile Creek do not appear to represent significant habitat for this species and there is low likelihood that it will be present in high numbers within the application area.

Eucalyptus rowleyi was recorded across much of the Mosquito land system during the Waters and Chalwell (2017) survey on flats and intermediate drainage lines where clay is present. It was abundant to the east of Five Mile Creek (forming dominant monocultures in the tree strata) but rarely occurred on the Mosquito land system to the west (Waters and Chalwell, 2017). It was not recorded in any of the major drainage channels including Five Mile Creek (Waters and Chalwell, 2017). Similar to *Acacia fecunda*, this species is not likely to be present in high numbers within the application area and the proposed clearing is not likely to have a significant impact on this species.

The Waters and Chalwell (2017) survey recorded *Goodenia nuda* on the banks on either side of Five Mile Creek on sandy soils. Given similar habitat is present within the application area, there is a high likelihood that this species is present within the application area. *Goodenia nuda* is known from numerous records across a wide distribution of the Pilbara (Western Australian

Herbarium, 1998-). There is suitable habitat present throughout the local area (surrounding 20 kilometres) and the proposed clearing is not expected to have a significant impact on this species at a local or regional scale.

No weed species were recorded within the application area. However, weeds are known disturbance invaders, and there is a risk that weeds can be spread into the area and become established as they have the potential to out-compete native flora and reduce the biodiversity of an area.

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on the 'stony saline plains of the Mosquito land system' PEC or habitat for Priority flora is not likely to be significant. There is potential for 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:

- take hygiene steps to minimise the risk of the introduction and spread of weeds.

3.2.2. Biological values (fauna) - Clearing Principle (b)

Assessment

A fauna survey was undertaken over the mining tenements directly adjacent to the south of the application area by Bamford Consulting Ecologists in 2016. Extrapolating the fauna habitat mapping from that survey, the following habitats are likely to be present within the application area (Bamford Consulting Ecologists, 2017):

- Major drainage lines;
- Minor drainage lines on clay/sand;
- Minor drainage lines on rock/sand;
- Alluvial floodplains of loam to sandy loam fringing major drainage lines and supporting Eucalypt Woodland, Acacia shrublands and Triodia hummock grasslands;
- Intermittently inundated loam soils on plains supporting Triodia hummock grasslands and open shrublands; and
- Intermittently saturated gravelly loam soils on plains supporting Triodia hummock grasslands and open shrublands.

As the majority of the application area is located within Five Mile Creek, it is likely that the most common habitat will be the major drainage lines habitat (Bamford Consulting Ecologists, 2017; Drilline Civil and Haulage, 2021). The application area also includes an area for stockpiling and screening on the alluvial floodplains on the western bank of Five Mile Creek. The following fauna habitats have been identified within this area (Zootopia, 2021):

- Open shrubland over an open grassland on sandy;
- Spinifex grassland with scattered shrubs on sandy loam;
- Tall shrubland over open grassland on sandy loam;
- Woodland over tall shrubland over grassland bordering Five Mile Creek.

A number of conservation significant fauna species have the potential to occur within the application area based on suitable habitat, including Bilby (*Macrotis lagotis* – Vulnerable), Brush-tailed Mulgara (*Dasyercus blythi* – Priority 4) and Northern Quoll (*Dasyurus hallucatus* – Endangered) (Bamford Consulting, 2017; Drilline Civil and Haulage, 2021; GIS Database). The Bilby and Brush-tailed Mulgara have both been recorded on the mining tenements to the south of the application area and have the potential to utilise sandplains within the application area for burrowing (Bamford Consulting, 2017; Drilline Civil and Haulage, 2021). A targeted search for Bilby and Brush-tailed Mulgara was undertaken within suitable habitat within the application area in December 2020 (Zootopia, 2021). No Bilby or Brush-tailed Mulgara burrows, diggings, tracks or scats were identified during the survey (Zootopia, 2021). Based on the results of this survey, it is considered that the vegetation within the application is not likely to provide significant habitat for these species.

The Northern Quoll has been previously recorded during surveys for the adjacent Nullagine Gold Project including evidence of tracks from within Five Mile Creek (Bamford Consulting Ecologists, 2017). Significant habitat for this species in the local area (20 kilometres) is hills with well-developed rock and boulder piles and woodland along major drainage lines (Bamford Consulting Ecologists, 2017). The major drainage line habitat within the application area is likely to be used for dispersal and foraging. Northern Quolls are also known to utilise hollows within large trees as denning sites. The applicant has committed to avoiding large trees and the vegetation within the dripline of large trees within the creekbed. Whilst the proposed clearing will remove some foraging habitat for this species, the retention of large trees which have the potential to be used as denning sites will minimise the impacts of clearing.

The Ghost Bat has been recorded several times in the local area (20 kilometres) (Bamford Consulting Ecologists, 2017; GIS Database). It is likely to utilise Five Mile Creek for dispersal and foraging. The proposed clearing is not likely to significantly impact on this species ability to move through the landscape or impact on the availability of prey species.

The large trees within the creekbed are also likely to be used by bird species for roosting and nesting and the retention of these trees will also benefit bird species in the local area.

Conclusion

Based on the above assessment, the proposed clearing will result in the loss in some foraging and dispersal habitat for fauna species including the Northern Quoll and Ghost Bat. The impact on fauna will be minimised by the retention of large trees within the creekbed.

Conditions

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

- no clearing of trees greater than 2 metres in height (or within the drip line of these trees)

3.2.3. Land and water resources - Clearing Principles (f), (g), (i) and (j)

Assessment

The majority of the application area lies within Five Mile Creek, an ephemeral watercourse approximately 16 kilometres long (GIS Database). Riparian vegetation plays an important role in stabilising the bed and banks of the creek, reducing erosion and sedimentation and providing nutrient cycling. Photographs and aerial imagery shows the presence of sparse vegetation within the majority of application area, associated with the sandy creek bed of Five Mile Creek (GIS Database). The proposed clearing is for the purpose of sand mining within the creek bed and the stockpiling and screening of materials in an area of adjacent plains. The applicants have stated that mining activities will not remove large trees within the creekbed or clear within two metres of the banks of the creek (other than areas where access ramps are located).

The application area is located within the Priority 1 area of the Nullagine Water Reserve (GIS Database). The Department of Water and Environmental Regulation (DWER) has provided advice that the proposed activities are compatible within the water reserve provided best management practices are used and all appropriate conditions are complied with (DWER, 2021). DWER (2021) provided guidance on best practice management for river sand mining which includes:

- Avoiding disturbance to riparian vegetation to maintain foreshore stability and protect important riparian habitats;
- Rehabilitating disturbed areas as soon as practical after the campaign;
- Excluding in-stream islands with established riparian vegetation;
- Select access ramp locations with minimal vegetation, gently sloping banks on straight sections of channels and avoiding eroding areas.

The applicant has committed to avoiding clearing riparian vegetation on the banks of the creek (apart from access ramps) and clearing within the drip line of trees within the creekbed (Drilline Civil and Haulage, 2021). There is an existing access ramp to the creek and excavation within the creekbed will target barren areas devoid of vegetation (Drilline Civil and Haulage, 2021). Rehabilitation of the project is detailed in the associated mining proposal and mine closure plan approved under the *Mining Act 1978*. If the proposed minimisation measures are implemented the clearing is unlikely to impact on water resources.

The application area lies within the Mosquito and River land systems (GIS Database). Only a portion of the access road is on the Mosquito land system, the rest of the application area is covered by the River land system (GIS Database). The Mosquito land system is described as stony plains and prominent ridges of schist and other metamorphic rocks supporting hard spinifex grasslands. This land system generally has low susceptibility to erosion except for some drainage floor units which are moderately susceptible if vegetation cover is lost (Van Vreeswyk et al., 2004). The River land system consists of active flood plains and major rivers supporting grassy eucalypt woodlands, tussock grasslands and soft spinifex grasslands. This land system may be highly susceptible to erosion if vegetation cover is removed (Van Vreeswyk et al., 2004). The risk from erosion will be minimised by the retention of trees within the creekbed and avoiding clearing the banks of the creek other than for access ramps (Drilline Civil and Haulage, 2021).

The majority of the application area is located within the creekbed of Five Mile Creek. The creek experiences flooding on a regular basis following large rainfall events. Provided trees within the creekbed and on the banks of the creek are retained, the proposed clearing is unlikely to contribute to any increased impacts from flooding in the local area.

Conclusion

Based on the above assessment, the proposed clearing has the potential to adversely impact land and water resources if avoidance, mitigation and management measures aren't implemented.

For the reasons set out above, it is considered that the impacts of the proposed clearing on land and water resources can be managed with conditions to be environmentally acceptable.

Conditions

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

- avoid, minimise to reduce the impacts and extent of clearing
- no clearing of trees greater than 2 metres in height (or within the drip line of these trees)
- avoid impacts to riparian vegetation where practicable and maintain surface water flow.
- clearing to take place within three months of sand extraction and associated activities commencing, to ensure cleared areas are opened up incrementally as required to reduce the potential for erosion and sedimentation.

3.3. Relevant planning instruments and other matters

Other relevant authorisations required for the proposed land use include:

- A Mining Proposal / Mine Closure Plan issued under the *Mining Act 1978*.
- Works approval / licence issued under Part V Division 3 of the EP Act.
- Permit to interfere with bed and banks under the *Rights in Water and Irrigation Act 1914*.

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

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

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 application area is located approximately five kilometres east of Nullagine. The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. It is within the riverbed and adjacent areas of Five Mile Creek (GIS Database).
Ecological linkage	According to available databases, the application area does not contain any known or mapped ecological linkages.
Conservation areas	The closest conservation area is the former Meentheena Pastoral Lease which is located approximately 47 kilometres north of the application area.
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation association: 190: Hummock grasslands, sparse shrub steppe; <i>Acacia bivenosa</i> & <i>A. trachycarpa</i> over hard spinifex, <i>Triodia wiseana</i>, very poor rocky country on gneiss (GIS Database).</p> <p>No flora or vegetation surveys have been conducted over the application area. A flora survey was undertaken over the mining tenements directly adjacent to the south of the application area by Waters and Chalwell in 2017. Extrapolating the vegetation mapping from that survey, the following vegetation associations are likely to be present within the application area (Waters and Chalwell, 2017):</p> <ul style="list-style-type: none"> • SSCG: Stony plain spinifex grassland with chenopod shrubs - Patchy hummock grasslands of <i>Triodia longiceps</i> with isolated to scattered shrubs <i>Acacia</i>, <i>Senna</i> and <i>Maireana</i> species; • DAHW: Drainage <i>Acacia</i> hummock grass shrubland / woodland; • DESG: Drainage spinifex grassland with eucalypt overstorey; • AHSG: Alluvial plain hard spinifex grassland; • ASSG: Alluvial plain soft spinifex grassland; and • AEBG: Alluvial plain eucalypt buffel grass woodland.
Vegetation condition	<p>Analysis of the adjacent flora survey and aerial imagery indicates the vegetation within the proposed clearing area is likely to be very good to very poor (Trudgen, 1991) condition.</p> <p>The full Trudgen (1991) condition rating scale is provided in Appendix C. Representative photos are available in Appendix D.</p>
Climate and landform	The application area is mapped at the elevation of 380 metres AHD (GIS Database). The annual average rainfall (Marble Bar) is 391.8 millimetres (BoM, 2022).
Soil description	The soil is mapped as soil unit Fa29 which is described as steep stony hills and low ranges on highly folded quartzites, shales, and slates with extensive areas of rock exposures; small valley plains are included; soils are generally stony and shallow: chief soils are shallow stony earthy loams (Northcote 1960-68).
Land degradation risk	The application area has been mapped as the Mosquito and River land systems (GIS Database).
Waterbodies	The majority of the application area is within the riverbed of Five Mile Creek (GIS Database).
Hydrogeography	The application area is within the Nullagine PDWSA (GIS Database). The mapped groundwater salinity is 7,000-14,000 milligrams per litre total dissolved solids which is described as saline (GIS Database).
Flora	There has been no previous records of Threatened or Priority flora within the application area (GIS Database). There are records of eight priority flora species within the local area (20 kilometres) (GIS Database).
Ecological communities	A small part of the application area which covers part of the access road to Five Mile Creek has been mapped as the 'Stony saline plains of the Mosquito Land System' Priority Ecological Community (GIS Database).
Fauna	According to available databases, three conservation significant fauna species have been recorded within the local area (20 kilometre radius). The most frequently recorded species is the Ghost Bat (<i>Macroderma gigas</i>).

A.2. Flora analysis table

Flora analysis of records within 20 kilometres of the application area (Drilline Civil and Haulage, 2021).

Species Name	Status	FloraBase (Western Australian Herbarium 2021) habitat, if available	Likelihood of occurrence
<i>Acacia aphanoclada</i>	P1	Skeletal stony soils. Rocky hills, ridges & rises.	Unlikely
<i>Acacia cyperophylla</i> var. <i>omearana</i>	P1	Stony & gritty alluvium. Along drainage lines.	Unlikely
<i>Acacia fecunda</i>	P1	Quartzite gibbers over grey-red skeletal soil. Along shallow creeks and drainage lines, hills, road verges.	Possible
<i>Atriplex spinulosa</i>	P1	No description in FloraBase It is reported as occurring on the stony saline plains in association with <i>Triodia longiceps</i> in the Nullagine region in the Priority Flora survey undertaken by Waters and Chalwell (2017). <i>Atriplex spinulosa</i> occurs sporadically in different regions (ALA 2021).	Unlikely
<i>Eucalyptus rowleyi</i>	P3	No description in FloraBase. Red sandy loams on plains and very minor and broad flood-out plains (Nicolle and French 2012)	Possible
<i>Indigofera ixocarpa</i>	P2	Skeletal red soils over massive ironstone	Unlikely
<i>Lepidium catapycnon</i>	P4	Skeletal soils. Hillsides.	Unlikely
<i>Ptilotus mollis</i>	P4	Stony hills and screes	Unlikely
<i>Ptilotus wilsonii</i>	P1	Stony gravelly soils. Rocky hills.	Unlikely
<i>Solanum</i> sp. Mosquito Creek (A.A. Mitchell <i>et al.</i> AAM 10795)	P1	No description in FloraBase. Located on schistose hillsides (Andrew Mitchell pers. comm.)	Unlikely
<i>Goodenia nuda</i>	P4	Not in the NatureMap search, however, recorded in the Waters and Chalwell (2017) survey along Five Mile Creek	Recorded on site

A.3. Fauna analysis table

Fauna analysis of records within 20 kilometres of the application area (Drilline Civil and Haulage, 2021).

Threatened Taxon	Status	Distribution and Habitat	Likelihood of occurrence and potential impacts from the proposed mining operations
<p><i>Calidris acuminata</i></p> <p>Sharp-tailed Sandpiper</p>	<p>BC Act 2016 International Agreement</p> <p>EPBC Act 1999 Migratory (Bonn, CAMBA, JAMBA, ROKAMBA) and Marine</p>	<p>The Sharp-tailed Sandpiper is a migratory species with a global distribution. It breeds in northern Siberia and then migrates to various locations throughout the world including Australia where it can inhabit both inland and coastal locations, and in both freshwater and saline habitats (DAWE 2021b).</p> <p>The habitat types include brackish wetlands, mud flats, saltmarsh with low vegetation, lagoons, swamps, lakes and pools near the coast, dams, waterholes, soaks, bore drains, saltpans, hypersaline saltlakes, saltworks and sewage farms (DAWE 2021b).</p>	<p>The Five Mile Creek bed that remains dry for much of the year would not appear to be habitat that the Sharp-tailed Sandpiper would utilise unless following rainfall when the creek flows. In the wet season when ponding occurs, mining operations are suspended.</p> <p>The Sharp-tailed Sandpiper is a highly mobile with the ability to egress from areas being disturbed.</p> <p>The small area of disturbance associated with the Project is considered negligible in relation to the huge area of potentially better wetland habitat occurring nationally and globally.</p> <p>Assessment outcome:</p> <p>On the basis of lack of ideal habitat, mining only during dry periods when this wetland species is unlikely to be present, the small area of disturbance and its mobility, it is considered highly unlikely that the Sharp-tailed Sandpiper would be impacted by the Project.</p>
<p><i>Ctenotus nigrilineatus</i></p> <p>Pin-striped Fine-snout Skink, Black-lined Ctenotus</p>	<p>Priority 1</p>	<p><i>Ctenotus nigrilineatus</i> has been recorded from only four localities, Tom Price, Meenthen Station, Woodstock and Nullagine (ALA 2021), over a distance of 325km between the furthest records (Tom Price to Meenthen Station).</p> <p>Little is known about the habitat preferences, spinifex and granite outcrops on hills (Wilson and Swan 2008, Storr <i>et. al</i> 1999). Populations have been confirmed at Nullagine (Bamford 2017). The 11 recorded Nullagine locations are associated with low rolling hills with clay or sandy soils or upland drainage lines with <i>Acacia trachycarpa</i> (Bamford 2017). <i>Ctenotus nigrilineatus</i> has not been recorded near M46/524 and is not associated with riverine areas.</p>	<p><i>Ctenotus nigrilineatus</i> has been recorded at Nullagine on low rolling hills and upland drainage lines. It has not been associated with the alluvial floodplain and riverine areas found at M46/524.</p> <p>Assessment outcome:</p> <p>On the basis of a lack habitat associated with <i>Ctenotus nigrilineatus</i>, it is considered unlikely that this species would occur at M46/524 and hence would not be impacted by the Project.</p>

Threatened Taxon	Status	Distribution and Habitat	Likelihood of occurrence and potential impacts from the proposed mining operations
<p><i>Dasyercus blythi</i></p> <p>Brush-tailed Mulgara, Ampurta</p>	<p>Priority 4</p>	<p>Unlike the Crest-tailed Mulgara, which prefers dune systems (Van Dyck and Strahan 2008), the Brush-tailed Mulgara can be found in most arid sandy habitats, especially sandy habitats where <i>Triodia</i> grasslands form the dominant component of the understorey (Van Dyck and Strahan 2008). The Brush-tailed Mulgara has been recorded at Nullagine and specifically along Five Mile Creek near M46/524 (Bamford 2017). The species is a common resident on sandplains throughout Nullagine area (Bamford 2017).</p>	<p>Evidence of the Brush-tailed Mulgara had been found on embankment areas along Five Mile Creek by Bamford (2017), refer to Figure 11. Given that it was not located in the proposed screening stockpiling area by Zooptopia (2020), the Project operations are therefore considered as being unlikely to have any impact on this species.</p> <p>The barren sandy creekbed areas where excavation will occur are not considered as affording habitat that the Mulgara would utilise.</p> <p>Assessment outcome:</p> <p>On the basis of Zooptopia (2020) survey on the embankment, and the mining along barren creekbed areas, it is considered that the Project is unlikely to have any impact on the Mulgara.</p>
<p><i>Dasyurus hallucatus</i></p> <p>Northern Quoll</p>	<p>BC Act 2016 Threatened (Endangered)</p> <p>EPBC Act 1999 Endangered</p>	<p>In the Pilbara region, the Northern Quoll has been recorded on basalt hills, mesas (and buttes of limonites), high and low plateaux, lower slopes, occasional tor fields and stony plains supporting either hard or soft spinifex grasslands, sandstone and dolomite hills and ridges, shrublands, sandy plains, clay plans and tussock grasslands and coastal fringes including dunes islands and beaches (DAWE 2021b, Van Dyck and Strahan 2008).</p> <p>The Northern Quoll has been recorded in the Nullagine area with affinity to dissected, rocky habitat and major drainage lines (Bamford 2017). No Northern Quolls have been recorded near M46/524, however, there is one recorded sighting approximately 8.6km south in the upper reaches of Five Mile Creek.</p>	<p>The Northern Quoll's preferred rocky habitat types are not present along Five Mile Creek. The Northern Quoll is also associated with woodlands along major watercourses. The embankment floodplains are unlikely to provide sheltering and foraging habitat due to the lack of trees. Where trees are located in the creek, these areas are excluded from mining under the self-imposed 3m drip-line buffer under the mining proposal. All creekline vegetation is avoided under the mining proposal.</p> <p>Assessment outcome:</p> <p>On the basis of a lack of suitable rocky habitat types and the avoidance of creekline vegetation, it is considered that the Northern Quoll will not be impacted by the Project.</p>

Threatened Taxon	Status	Distribution and Habitat	Likelihood of occurrence and potential impacts from the proposed mining operations
<i>Macroderma gigas</i> Ghost Bat	<i>BC Act 2016</i> Threatened (Vulnerable) <i>EPBC Act 1999</i> Vulnerable	The Ghost Bat requires roost sites that include caves, rock crevices and disused mine shafts (DAWE 2021b, Van Dyck and Strahan 2008). The Ghost Bat has been recorded in the Nullagine area on numerous occasions since 1956 where it has specificity for abandoned underground mine workings (Bamford 2017).	The Ghost Bat is unlikely to occur in M46/524 except for nocturnal foraging excursions. M46/524 is totally devoid of the underground mine workings that is utilises for diurnal roosts. Assessment outcome: On the basis of lack of roosting sites and possible occurrence only during nocturnal hours when mining is not occurring, it is considered highly unlikely that Ghost Bat would be impacted by the Project.
<i>Macrotis lagotis</i> Bilby, Greater Bilby	<i>BC Act 2016</i> Threatened (Vulnerable) <i>EPBC Act 1999</i> Vulnerable	The Bilby inhabits a range of habits including tussock grassland on uplands and hills, <i>Acacia aneura</i> woodland / shrubland on ridges and rises, and hummock grassland in plains and alluvial areas (DAWE 2021b, Van Dyck and Strahan 2008). The Bilby has been recorded at Nullagine and specifically along Five Mile Creek near M46/524 (Bamford 2017). In the Nullagine area, the Bilby has been associated with the margins of drainage systems and the adjacent sandy plains (Bamford 2017). The species is highly nomadic with many active and disused burrows within an animal's home range (Dzimirski and Carpenter 2017). Populations can fluctuate widely with animal densities generally being low (Dzimirski and Carpenter 2017).	The Bilby had been found on embankment areas along Five Mile Creek by Bamford (2017) and Dzimirski and Carpenter (2017), refer to Figure 11. Given that it was not located in the proposed screening stockpiling area by Zooptopia (2020), the Project operations are therefore considered as being unlikely to have any impact on this species. The barren sandy creekbed areas where excavation will occur are not considered as affording habitat that the Bilby would utilise. Assessment outcome: On the basis of Zooptopia (2020) survey on the embankment, and the mining along barren creekbed areas, it is considered that the Project is unlikely to have any impact on the Bilby.

Threatened Taxon	Status	Distribution and Habitat	Likelihood of occurrence and potential impacts from the proposed mining operations
<i>Pseudomys chapmani</i> Western Pebble-mound Mouse, Ngadji	Priority 4	The Western Pebble-mound Mouse inhabits gentler slopes of hills and rocky ranges that are covered in small-sized stony scree that it requires to build its subterranean nests (Van Dyck and Strahan 2008). The Western Pebble-mound Mouse has been recorded previously at Nullagine (Bamford 2017). However, the lack of active mounds suggests it may be locally extinct (Bamford 2017). The M46/524 alluvial and riverine landscape is totally devoid of the scree covered hills that is associated with the Western Pebble-mound Mouse.	The Western Pebble-mound Mouse's required habitat substrate of stony scree is not present in the Project area. Assessment outcome: On the basis of lack of suitable habitat type, it is considered highly unlikely that the Western Pebble-mound Mouse would occur in the Project area.
<i>Rhinonictis aurantia</i> Pilbara Leaf-nosed Bat	<i>BC Act 2016</i> (Threatened) Vulnerable <i>EPBC Act 1999</i> Vulnerable	The Pilbara Leaf-nosed Bat roosts in caves and abandoned, deep and partially flooded mines that trap pockets of warm, humid air. This species relies on underground roosting sites supporting warm, high humidity microclimates. Only relatively deep, complex caves and disused underground mines contain such conditions (DAWE 2021b). The Pilbara Leaf-nosed Bat has been recorded from the Nullagine area and may inhabit scattered underground mine workings that possess the right combination of factors such as suitable microclimates and close-by waterholes (Bamford 2017).	The Pilbara Leaf-nosed Bat is unlikely to occur in the Project area except for nocturnal foraging excursions. The Project area is devoid of roosting and denning habitat for daytime sheltering. Assessment outcome: On the basis of lack of roosting sites and possible occurrence only during nocturnal hours when mining is not occurring, it is considered highly unlikely that Pilbara Leaf-nosed Bat would be impacted by the Project.

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> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>A portion of the application area is mapped as the ‘stony saline plains of the Mosquito land system’ (Priority 3) priority ecological community (PEC). The application area also contains habitat for Priority flora species.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contains foraging and potential denning habitat for conservation significant fauna.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u></p> <p>There are no known records of Threatened flora within the permit area (GIS Database). Based on the habitat present, Threatened flora species known from the Pilbara are not likely to be present within the permit area and 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>There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the permit area (GIS Database).</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 extent of the mapped vegetation type is consistent with the national objectives and targets for biodiversity conservation in Australia. The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage 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 in the vicinity of the application area. The nearest DBCA managed land is the former Meentheena Pastoral Lease which is located approximately 47 kilometres north of the application area (GIS Database). Given the distance to the nearest conservation area, 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		

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (f):</u> "Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."</p> <p><u>Assessment:</u></p> <p>The majority of the application area is located within the creekbed of Five Mile Creek.</p>	At variance	Yes <i>Refer to Section 3.2.3, above.</i>
<p><u>Principle (g):</u> "Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."</p> <p><u>Assessment:</u></p> <p>The majority of the application area is mapped as the River land system. This land system has a high risk of erosion if vegetation cover is removed (Van Vreeswyk et al., 2004).</p>	May be at variance	Yes <i>Refer to Section 3.2.3, above.</i>
<p><u>Principle (i):</u> "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."</p> <p><u>Assessment:</u></p> <p>Given the application area is located within the Nullagine Water Reserve PDWSA and will involve the mining of sand from the creekbed of Five Mile Creek, it has the potential to adversely affect downstream water resources.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.3, above.</i>
<p><u>Principle (j):</u> "Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."</p> <p><u>Assessment:</u></p> <p>The proposed clearing area is known to experience natural flooding events on infrequent occasions, coinciding with major weather events. The proposed clearing area is small in comparison to the size of the Five Mile Creek and is unlikely to cause, or exacerbate the incidence or intensity of flooding.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.3, above.</i>

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. Photographs of the vegetation

Photos from supporting documents (Drilline Civil and Haulage, 2021).



Photo 1: Access track on Miscellaneous Licence 46/113



Photo 2: Previously mined areas on Mining Lease 46/524



Photo 3: Unmined areas on Mining Lease 46/524



Photo 4: Entry point onto creekbed.

Appendix E. Sources of information

E.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- 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
- Pre-European Vegetation Statistics

- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape 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)

E.2. References

- Bamford Consulting Ecologists (2017) Millennium Minerals, Nullagine Operations, Overview of Fauna Studies. Prepared for Millennium Minerals Ltd, by Bamford Consulting Ecologists, 7 May 2017.
- Drilline Civil and Haulage (2021) Supporting Information for a Clearing Permit Application for the Five Mile Creek Project at Nullagine. Drilline Civil and Haulage, August 2021.
- Department of Biodiversity, Conservation and Attractions (DBCA) (2020) Priority Ecological Communities for Western Australia Version 29. Prepared by Species and Communities Program, Department of Biodiversity, Conservation and Attractions, 5 May 2020.
- Department of Environment Regulation (DER) (2013) *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf.
- 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 15 February 2022).
- Department of Water and Environmental Regulation (DWER) (2021) Procedure: Native vegetation clearing permits. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF.
- Department of Water and Environmental Regulation (DWER) (2021) Advice received in relation to Clearing Permit Application CPS 9385/1. Department of Water and Environmental Regulation, Western Australia, August 2021.
- Environmental Protection Authority (EPA) (2016) Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment. Available from: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf.
- Environmental Protection Authority (EPA) (2016) Technical Guidance – Terrestrial Fauna Surveys. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.pdf.
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- 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.
- Waters, A. & Chalwell, S. (2017) Priority Flora of the Mosquito Land System. Prepared for Millennium Minerals Ltd, by Woodgis and Plantecology Consulting, May 2017.
- Waters, A. (2017) Vegetation of the MML Nullagine Tenements. Report prepared for Millennium Minerals Ltd, by Woodgis and Plantecology, May 2017.
- Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed 15 February 2022).
- Zootopia (2021) Targeted Fauna Survey, Proposed Working Area, Five Mile Creek Sand Project. Prepared for Drilline Civil and Haulage, by Zootopia Environmental Services, January 2021.

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
RWI 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.

Specialty 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.