

## 1. Application details and outcomes

### 1.1. Permit application details

<b>Permit number:</b>	10569/1
<b>Permit type:</b>	Purpose Permit
<b>Applicant name:</b>	Hamersley Iron Pty Ltd
<b>Application received:</b>	25 March 2024
<b>Application area:</b>	20 hectares
<b>Purpose of clearing:</b>	Establishment and operation of a managed aquifer recharge scheme, fauna/flora monitoring access, groundwater/hydrogeological monitoring access, infrastructure access, and Aboriginal Heritage survey/access.
<b>Method of clearing:</b>	Mechanical Removal
<b>Tenure:</b>	<i>Iron Ore (Hamersley Range) Agreement Act 1963</i> , Mineral Lease 4SA (AML70/4) <i>Iron Ore (Hamersley Range) Agreement Act 1963</i> , Mining Lease 272SA (AM70/272)
<b>Location (LGA area/s):</b>	Shire of Ashburton
<b>Colloquial name:</b>	Silvergrass East - Managed Aquifer Recharge (MAR) Scheme

### 1.2. Description of clearing activities

Hamersley Iron Pty Ltd proposes to clear up to 20 hectares of native vegetation within a boundary of approximately 400.95 hectares, for the purpose of establishment and operation of a managed aquifer recharge scheme, fauna/flora monitoring access, groundwater/hydrogeological monitoring access, infrastructure access, and Aboriginal Heritage survey/access (Hamersley Iron Pty Ltd, 2024b). The project is located approximately 67 kilometres northwest of Tom Price, within the Shire of Ashburton (GIS Database).

The application is to allow for the establishment of a Managed Aquifer Recharge (MAR) scheme and associated activities (Hamersley Iron Pty Ltd, 2024b). The project is an environmental management strategy for mitigation of potential impacts to groundwater dependent vegetation communities as a result of dewatering at Silvergrass East Iron Ore Mine (Rio Tinto, 2024). The scope of works includes installing up to 30 monitoring bores (Rio Tinto, 2024).

### 1.3. Decision on application and key considerations

<b>Decision:</b>	Grant
<b>Decision date:</b>	29 November 2024
<b>Decision area:</b>	20 hectares of native vegetation

### 1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed, and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advertised the application for a public comment for a period of 21 days, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix B), relevant datasets (Appendix H), supporting information provided by the applicant including the results of a flora and vegetation survey, the clearing principles set out in Schedule 5 of the EP Act (Appendix C), 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;
- impacts to conservation significant flora species; and
- impacts to conservation significant fauna and their associated habitat;
- potential impacts to adjacent threatened ecological community; and
- potential impacts to two adjacent priority ecological communities.

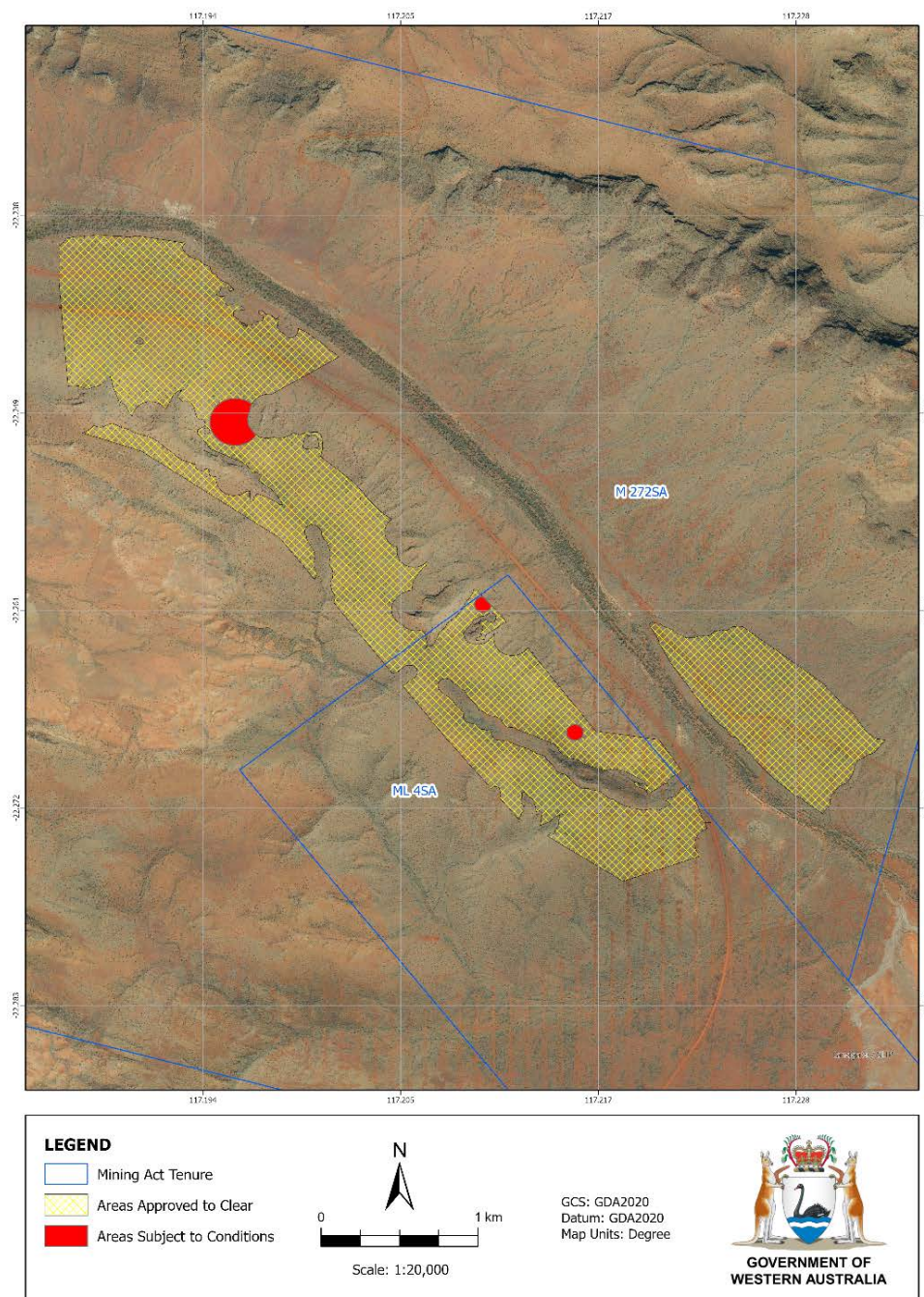
After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

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;
- no clearing within 10 metres of priority flora *Indigofera rivularis*, unless first approved by the CEO;
- vegetation management – avoid riparian vegetation and where a watercourse is to be impacted by clearing, the permit holder shall ensure that the existing surface flow is maintained;
- undertake slow, progressive one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity;
- restricted clearing condition to avoid critical habitat for conservation significant fauna species; and
- retain cleared vegetation and topsoil and respread this on a cleared area of equivalent size within the permit boundary within 12 months of clearing to ensure vegetation and fauna habitat is not permanently lost.

## 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. The red area indicates the areas subject to restricted clearing condition.**

## 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)
- *Biosecurity and Agriculture Management Act 2007* (BAM Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Iron Ore (Hamersley Range) Agreement Act 1963*
- *Rights in Water and Irrigation Act 1914*

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2014)
- *Procedure: Native vegetation clearing permits* (DWER, October 2021)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2020)

## 3. Detailed assessment of application

### 3.1. Avoidance and mitigation measures

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 provided operational control measures (Hamersley Iron Pty Ltd, 2024a; Hamersley Iron Pty Ltd, 2024b; Rio Tinto, 2024):

- clearing will be undertaken with raised blade technique, where possible;
- existing tracks will be utilised, where possible, to minimise total clearing required;
- implementation of a 150 metre buffer surrounding deep cave and future monitoring;
- Rio Tinto Approvals Request Co-ordination System including spatially identified significant biological and environmental features with appropriate buffers included;
- Health, Safety, Environment and Quality Management System;
- rehabilitation of cleared areas that are no longer required for the purpose for which they were cleared, will be carried out on completion of the authorised activity;
- cleared areas will be reprofiled to reflect the previously undisturbed landform then ripped on the contour to impede erosion; and
- stockpiled topsoil and cleared vegetation will be returned to the disturbed areas to promote vegetative regeneration.

### 3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix B) 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, 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)

##### Assessment

A reconnaissance flora and vegetation survey was conducted by SLR over the application area during a single field trip between 17 to 21 July 2023, noting survey timing limitations (SLR, 2024). An additional two flora and vegetation surveys overlap the boundary of the application area but are not limited to:

- Stantec (2021) Greater Brockman Syncline: Consolidated Vegetation Type and Condition mapping (survey conducted in May and August 2019); and
- Biota (2019a) Silvergrass West Detailed flora and vegetation survey Phase 1 and 2. Prepared for Rio Tinto (survey conducted in October 2018 and March 2019).

A total of 160 species from 158 genera and 32 families were recorded within the application area (SLR, 2024), however this is potentially an underrepresentation due to the survey being undertaken outside the most suitable survey period for detection and identification, and minimal rainfall recorded within the three months prior (SLR, 2024).

##### **Priority flora**

Two priority flora species *Indigofera rivularis* (P3) and *Triodia basitricha* (P3) were recorded within the application area (SLR, 2024). Two priority flora species; *Acacia dawweana* (P3) and *Goodenia obscurata* (P3) were considered to have a medium likelihood of occurrence and numerous species have a low likelihood of occurrence (SLR, 2024; GIS Database).

### ***Indigofera rivularis***

*Indigofera rivularis* occurs in the Hamersley subregion of the Pilbara extending from approximately 10 kilometres south of Pannawonica to approximately 30 kilometres west of Tom Price (Western Australian Herbarium, 1998-). The preferred habitat is along rocky creek-lines in open low woodland of eucalypts and *Acacias* on ironstone substrates (Wilson, 2021). Within the application area, a total of 34 individuals of *Indigofera rivularis* were recorded from five locations, predominantly among rocky gullies (EIIAmTe vegetation type) and drainage lines (ChAtpTe vegetation type), with one record within the ecotone region of vegetation type EIIAaT spp (SLR, 2024). The habitat for this species is approximately 4.6 hectares (SLR, 2024). The Rio Tinto database has approximately 29,669 unimpacted regional records for this species (Rio Tinto, 2024). Large gullies and major watercourses were excluded from the application area (SLR, 2024), therefore limited habitat availability to support *Indigofera rivularis* occurs within the application area. Potential impacts to this species can be minimised with the implementation of a flora management condition to avoid clearing individuals.

### ***Triodia basitricha***

*Triodia basitricha* occurs in the Pilbara and Gascoyne regions across four subregions extending from approximately 25 kilometres northeast of Pannawonica to 110 kilometres east of Tom Price and 35 kilometres northwest of Marble Bar (Western Australian Herbarium, 1998-). The habitat is described from slopes or crests of rocky hills which may indicate a more 'refugial habitat' requirement, as is common with several other Pilbara *Triodia* species (Barrett and Barrett, 2015). Within the application area, a total of 8,426 individuals of *Triodia basitricha* were recorded from 21 locations, forming a dominant to co-dominant hummock grassland with *Triodia wiseana* and *Triodia epactia* (SLR, 2024). It occurred mostly on hill tops, slopes and footslopes/plains in vegetation types: EIIAtkTb, EIIAaT spp, and EIIMvT spp, and was also sparsely recorded within vegetation types ChEgTw and EIIAeTw (SLR, 2024). The Rio Tinto database has approximately 154,525 unimpacted regional records for this species (Rio Tinto, 2024). Database records appear to occur in isolated patches, however local and regional populations have noted this species to be locally common with up to 50,000 individuals within a population (Barrett and Barrett, 2015; Western Australian Herbarium, 1998-). The proposed clearing is 20 hectares within a boundary of approximately 400.95 hectares, limiting clearing to approximately 5 percent (421 individuals) of the local population. Habitat is common across application area and extends beyond the boundary (SLR, 2024). Given the local species abundance and suitable adjacent habitat, the proposed clearing may potentially impact the local population but is unlikely to be significant at a regional or species level. Considerations should be taken into account during planning to minimise local impacts to the conservation status of this species when determining the location of monitoring bores.

### ***Acacia bromilowiana***

*Acacia bromilowiana* occurs in the Hamersley and Chichester subregions of the Pilbara extending from approximately 55 kilometres southeast of Pannawonica to 40 kilometres west of Newman, with a couple of records northeast of that location (Western Australian Herbarium, 1998-). Habitat for this species is described rocky hills, breakaways scree slopes, gorges and creek beds (Western Australian Herbarium, 1998-). This species flowers between July to August and habitat was recorded within the application area, however no individuals were identified during field survey (SLR, 2024). Given this species was not recorded and habitat extends into surrounding area, the proposed clearing is unlikely to significantly impact the conservation status of this species.

### ***Goodenia obscurata***

*Goodenia obscurata* occurs in the in the Pilbara and Carnarvon regions across five subregions extending from approximately 40 kilometres west of Pannawonica to 30 kilometres northeast of Tom Price, with a single population recorded in Carnarvon (Shepherd and Lepschi, 2023, Western Australian Herbarium, 1998-). This species occurs on floodplains, or low rocky ridges, with soil described as red-brown sandy clay or lateritic loam over banded ironstone (Shepherd and Lepschi, 2023). This species flowers between April, May and August to October, with fruits recorded between April to October (Shepherd and Lepschi, 2023). This species has recently been described in October 2023, therefore was not recognised during the field survey. *Goodenia obscurata* has previously been referred to as *Goodenia connata*, which is morphologically similar to *Goodenia obscurata* (Shepherd and Lepschi, 2023). *Goodenia connata* was not recorded during the field survey and other species of *Goodenia* recorded did not share similar morphological features. Habitat for this species occurs within the application area, however, it is unlikely to have been recorded and habitat extends into surrounding area. The proposed clearing is unlikely to significantly impact the conservation status of this species.

### **Other conservation significant flora**

Several species of priority flora from the flora analysis table (Appendix B.2) have been identified to potentially occur within the application area with a low likelihood of occurrence (SLR, 2024). Many of the conservation significant flora that occur within the local surrounds are restricted to specific landforms such as major drainage, cracking clay or deeply incised gullies (SLR, 2024). These habitats occur within close proximity to the application area, however the applicant has not included cracking clay, major drainage and major gullies within the application (Rio Tinto, 2024).

### **Threatened and Priority Ecological Communities**

The application area occurs within one kilometre of three Threatened or Priority Ecological Communities listed in Appendix B (GIS Database). Themeda grasslands (*Themeda* sp. Hamersley Station (M.E. Trudgen 11431)) on cracking clays (Hamersley Station, Pilbara) (CR) comprises of open to closed tussock grassland on cracking clays dominated by *Themeda* sp. Hamersley Station (DBCA, 2024). Most of the application area is described as red brown clay loam, however cracking clay landform did not occur within the application area, nor did any of the associated vegetation (SLR, 2024). Brockman Iron cracking clay communities of the Hamersley Range (P1) occurs on the Brockman land system dominated by *Astrelba lappacea* (DBCA, 2024). The soil and vegetation within this community was not recorded within the application area (SLR, 2024). Riparian flora and plant communities of springs and river pools with high water permanence (P2) includes flora with restricted distribution (DBCA, 2024) and the buffer region occurs within the application area (GIS Database), however no permanent water or associated vegetation was recorded within the application area (SLR, 2024). While three conservation significant ecological communities occur within close proximity to the application area, none of the vegetation or land systems appear to be analogous to these ecological communities and the proposed clearing is unlikely to significantly impact the conservation status

of these communities (SLR, 2024; Rio Tinto, 2024). The implementation of a weed management condition will minimise impacts to adjacent Threatened and Priority Ecological Communities.

### **Introduced flora**

Three weed species have been recorded within the application area, including: *Bidens bipinnata*, *Cenchrus ciliaris*, and *Malvastrum Americanum* (SLR, 2024). None of the species are listed as Weeds of National Significance or declared pest plants in Western Australia under the *Biosecurity and Agriculture Management Act 2007*, however weeds have potential to out-compete native flora and reduce biodiversity of an area. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

### **Conclusion**

Based on the above assessment, the proposed clearing will result in impacts to priority flora species; *Indigofera rivularis* and *Triodia basitricha* and potential secondary impacts to adjacent Threatened and Priority Ecological Communities. For the reasons set out above, it is considered that the impacts of the proposed clearing can be managed by the implementation of weed management, flora management and rehabilitation conditions.

### **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;
- no clearing within 10 metres of *Indigofera rivularis* unless first approved by the CEO; and
- retain cleared vegetation and topsoil and respread this on a cleared area of equivalent size within the permit boundary within 12 months of clearing to ensure vegetation is not permanently lost.

## **3.2.2. Biological values (fauna) - Clearing Principles (b)**

### **Assessment**

A basic terrestrial vertebrate fauna survey was conducted by SLR over the application area during a single field trip between 17 to 21 July 2023 (SLR, 2024). An additional three fauna surveys overlap the boundary of the application area but are not limited to:

- Biologic (2022) Brockman Syncline 2020-2021 Fauna Matters of National Environmental Significant Study (survey conducted over multiple trips in March, June to November 2020 and February to June 2021);
- Biologic (2020) Brockman Syncline Targeted Vertebrate Fauna Survey (survey conducted between August and November 2019); and
- Biota (2019b) Silvergrass West Detailed Fauna Survey Phase 1 and 2 (survey conducted in November 2018 and March 2019).

### **Fauna habitat**

Three broad fauna habitat types and disturbed areas were mapped within the application area (SLR, 2024; Appendix B; Appendix E; Appendix G):

- low hills and slopes 274 hectares (68.34%) – high value
- stony plain: 114.52 hectares (28.56%) – moderate value
- minor drainage 2.79 hectares (0.69%) – moderate value
- disturbed areas: 9.65 hectares (2.41%)

All fauna habitats are not considered to be restricted at a local or regional level and extend beyond the boundary of the application area (SLR, 2024; Rio Tinto, 2024). One deep cave and two shallow caves were identified within the low hills and slopes habitat (SLR, 2024; Appendix G). The applicant proposed a 150 metres buffer surrounding the deep cave (Hamersley Iron Pty Ltd, 2024a). Major watercourse and major gully habitat has not been included within the application area and caves identified outside the application area but within close proximity have a buffer of approximately 100 metre to minimise impacts to conservation significant fauna and their associated habitats (Biologic, 2020; Rio Tinto, 2023). A small patch of mulga woodland was recorded within the stony habitat type, however, is too small and isolated to provide substantial habitat value (SLR, 2024). Implementation of restricted clearing zones will minimise impacts to critical habitat and high value foraging habitat directly adjacent caves that may be utilised by a number of conservation significant species.

Conservation significant fauna with a high likelihood of occurrence:

- Northern quoll (*Dasyurus hallucatus*) (EN)
- Ghost bat (*Macroderma gigas*) (VU)
- Pilbara leaf-nose bat (Pilbara form) (*Rhinonictis aurantia*) (VU)
- Pilbara olive python (*Liasis olivaceus barroni*) (VU)
- Peregrine falcon (*Falco peregrinus*) (OS)
- Gane's Blind Snake (*Anilius ganei*) (P1)
- Western pebble-mound mouse (*Pseudomys chapmani*) (P4)
- Short-tailed mouse (*Leggadina lakedownensis*) (P4)
- Lined soil-crevice skink (*Notoscincus butleri*) (P4)

Conservation significant fauna with a medium likelihood of occurrence:

- Grey Falcon (*Falco hypoleucos*) (VU)
- Oriental Plover (*Charadrius veredus*) (MI)
- Pilbara barking gecko (*Underwoodisaurus seorsus*) (P2)
- Striated grasswren (sandplain) (*Amytornis striatus striatus*) (P4)
- Long-tailed dunnart (*Antechinomys longicaudata* formerly *Sminthopsis longicaudata*) (P4)

### **Northern quoll**

The northern quoll can be found in a variety of habitats, with a preference to complex rocky areas in the Pilbara (DNREAS, 2010). Daytime den sites provide important shelter and protection from predators and weather, occurring in rocky outcrops, tree hollows, logs, termite mounds and goanna burrows (DNREAS, 2010). The National Recovery Plan for the Northern Quoll (DNREAS, 2010) states that habitat critical to survival is where the species is least exposed to threats, with this broadly being defined as rocky areas and offshore islands. The Rio Tinto Database identified six records of northern quoll within one kilometre of the application area and potential secondary evidence in the form of tracks and a scat within the application area (SLR, 2024). The low hills and slopes and stony plain habitat is low value habitat as individuals may potentially utilise this habitat, however are not reliant on them, however, the caves recorded within this habitat type provides denning habitat and constitutes as critical habitat for the northern quoll (SLR, 2024). Drainage habitat associated with flowlines is considered to hold high habitat value, as these areas facilitate connectivity for dispersal and foraging (Cowan *et al.*, 2022; Shaw *et al.*, 2023). Significant major and minor drainage habitat surrounding the application area were not included in the application, as these areas will not be impacted by the proposed clearing (Rio Tinto, 2024). Impacts on critical habitat for northern quoll can be minimised by the implementation of a restricted clearing condition to avoid caves that provide suitable denning habitat and watercourse management condition to avoid riparian vegetation. Considerations should be taken into account during planning to minimise local impacts to microhabitat features such as tree hollows, logs, termite mounds and goanna burrows.

### **Ghost bat**

The ghost bat is a carnivorous species with patchy distribution of isolated populations within the semi-desert Pilbara region (Bat Call WA, 2021a; Bullen, 2023). This species moves seasonally or as dictated by weather conditions between a number of roost sites in caves, rock crevices and disused mine adits (Bat Call WA, 2021a). Excluding colonies in large, abandoned mines, ghost bats in the Pilbara region are often present either singularly or in small groups of less than 15 (Bat Call WA, 2021a). This species depends on day roosts found deep underground in temperature-stable caves with chambers and/or cavities that trap humidity (Bat Call WA, 2021a). The Pilbara populations forage on productive plain areas with thin mature woodland over patchy or clumped tussock or hummock grass on sand or stony ground and drainage lines along riparian corridors (Bat Call WA, 2021a; Cramer *et al.*, 2022). Ghost bats tend to forage less than 5 kilometres from diurnal roost sites, although larger distances have been recorded (TSSC, 2016). There is a record of ghost bat within the application area (GIS Database) and Rio Tinto's Database has 17 records within 200 metres of the application area (SLR, 2024). The caves were not assessed during the survey, however, SLR observed the caves externally and noted potential critical microhabitats (SLR, 2024). Rio Tinto's internal fauna specialist visited the site and considered the deep cave to be classed as category 2 cave, while the two shallow caves did not lead anywhere and would not be suitable for roosting (Hamersley Iron Pty Ltd, 2024a). Category 1 and 2 caves are classified as maternity/diurnal roost sites with permanent or regular occupancy described as deep and dark with reasonably narrow entrances and a steady microclimate (Bat Call WA, 2021a). Characteristics of the caves were not provided; however, the clearing activities are considered low impact and involve limited drilling and earthworks; therefore, the applicant proposed a 150 metre buffer for the deep cave (Hamersley Iron Pty Ltd, 2024a). The stony plain habitat and minor drainage habitat is considered to be of moderate habitat value as this species potentially utilise these areas for foraging and dispersal (SLR, 2024). Impacts can be minimised with the implementation of a restricted clearing condition to protect high value roosting and foraging habitat and water course management to avoid riparian vegetation.

### **Pilbara leaf-nose bat**

The Pilbara leaf-nose bat (PLNB) is a slightly divergent form of the Orange leaf-nose bat that occurs only in the Pilbara region. The PLNB forages in a variety of habitats and roosts during the day in the dark areas of caves and underground mines with stable, warm and humid microclimates (Bat Call WA, 2021b). Females are highly dependent on foraging habitat within close proximity to maternal roosts and are typically located within 5-7 kilometres from permanent water, however the species is known to travel up to 45 kilometres from roosts to forage (Bat Call, 2021b; Bullen; 2023). There are three records of PLNB within the application area and Rio Tinto's database has nine records within 200 metres of the application area (SLR, 2024). There are known PLNB roosts within close proximity of the area proposed to be cleared (Biologic, 2020; GIS Database). The PLNB is an obligate deep-cave roosting species (Bullen and Reiffer, 2020). Category 1 and 2 caves are classified as permanent or semi-permanent diurnal roosts (Bat Call WA, 2021b). Similarly to the ghost bat, the deep cave identified within the low hills and slopes habitat is potentially critical habitat for the PLNB and the applicant has proposed a 150 metre buffer to minimise impacts (Hamersley Iron Pty Ltd, 2024a). The shallow caves are unlikely to be used by the PLNB for roosting (SLR, 2024). Impacts can be minimised with the implementation of a restricted clearing condition to protect high value habitat and water course management to avoid riparian vegetation.

### **Reptiles**

The Pilbara olive python is a subspecies of olive python that is endemic to the Pilbara and northern Gascoyne regions (Smith, 1981; Pearson, 1993; Storr *et al.*, 2002). Common habitat characteristics for this species is rocky gorges, gullies, and permanent waterholes (Rayner *et al.*, 2016). During warmer months, Pilbara olive python is typically encountered in riparian vegetation where they utilise water bodies to hunt and ambush prey from a submerged position, while other times of the year they are generally found in rocky habitats (DEWHA, 2008). The Rio Tinto Database have two records within one kilometre of the application area (SLR, 2024). There is limited rocky area habitat and no permanent waterbodies within the application area (SLR, 2024). This species is cryptic in nature and is likely to transmit through the application area, mostly within riparian vegetation habitat associated with drainage lines (SLR, 2024). Potential impacts to habitat can be minimised with a watercourse management condition to avoid riparian vegetation.

The Gane's Blind Snake is restricted to the Pilbara region, typically found between Newman and Pannawonica (Wilson and Swan, 2021). This species is generally associated with moist gullies and gorges (Wilson and Swan, 2021). The Rio Tinto Database has a record of this species within 2 kilometres of the application area (SLR, 2024). Minor drainage habitat within the application area is potentially suitable habitat (SLR, 2024). Impacts can be minimised with a watercourse management condition to avoid riparian vegetation.

The lined soil-crevice skink has a distribution encompassing most of the western Pilbara from Dampier Peninsula, Panawonica and Karijini National Park. This species is associated with spinifex-dominated areas near riparian vegetation where it forages in leaf litter (Wilson and Swan, 2021). This species has been recorded within 3 kilometres south of the application area with core habitat identified as stony plain and minor drainage (SLR, 2024). Impacts can be minimised with a slow directional clearing condition.

The Pilbara barking gecko is known from the Hamersley Range in the Pilbara, from north of Tom Price to southeast of Newman (Wilson and Swan, 2021). This species preferred habitat is rocky slopes and gorges with sparse tree cover and spinifex (*Triodia* spp.) dominant ground cover (Cogger, 2018). The Rio Tinto Database has one record of this species within 2 kilometres of the application area (SLR, 2024). The hills and low slopes habitat is considered core habitat, while other areas of the application area would be supporting habitat (SLR, 2024). The habitat is common in the region and the proposed clearing is unlikely to significantly impact the conservation status of this species. Impacts can be minimised with a slow directional clearing condition.

### **Small mammals**

The Western pebble-mound mouse has a distribution through the non-coastal, central and eastern parts of the Pilbara, with large populations recorded in the major national parks of the region (Karijini, Rudall River, Millstream-Chichester and Collier Range) (Burbidge, 2016). This species is found in areas of rocky, hummock grassland with little or no soil and an overstorey of Acacia (Burbidge, 2016). Individuals live in groups in burrows below mounds of pebbles, typically on low gravelly and stony rises (Burbidge, 2016). An inactive mound was recorded within the application area (SLR, 2024), with suitable habitat identified in the low hills/slopes and stony plain habitat types (SLR, 2024). No recent evidence of Western pebble-mound mouse was observed during the field survey (SLR, 2024). The habitat is common in the region and the proposed clearing is unlikely to significantly impact the conservation status of this species.

The northern short-tailed mouse occurs across northern Australia from the Pilbara in the west to Cape York Peninsula in the east (Aplin *et al.*, 2016). This species is found in areas of open tussock and hummock grassland, Acacia shrubland and savanna woodland, on alluvial clay or sandy soils (Aplin *et al.*, 2016). The Rio Tinto Database has two records within 3 kilometres of the application area. The habitat is common in the region and the proposed clearing is unlikely to significantly impact the conservation status of this species. Impacts can be minimised with a slow directional clearing condition.

The long-tailed dunnart is known from remote and disparate locations throughout the arid zone in the Gibson Desert, southern Carnarvon Basin, Rangelands and Pilbara (Western Australian Museum, 2024). Common habitat characteristics are described as elevated landforms such as hills, ridges, breakaways with sparse vegetation (Western Australian Museum, 2024). Records of this species are patchy and limited, however where populations have been recorded, abundance of individuals is high (Western Australian Museum, 2024). The most recent record for this species was 28 kilometres from the application area (SLR, 2024). Low hills and slopes habitat type within the application area may support this species as core habitat, however, this habitat is common in the region and the proposed clearing is unlikely to significantly impact the conservation status of this species. Impacts can be minimised with a slow directional clearing condition.

### **Birds**

The grey falcon is an elusive species distributed through central, northern and north-western Australia, associated with arid to semi-arid lowland plains, particularly acacia shrublands crossed by tree-lined watercourses (DAWE, 2020). The peregrine falcon is found across Australia, and typically nests on rocky ledges in tall, vertical cliff faces and gorges, or in tall trees associated with drainage lines (Australian Museum, 2019). There is potential for both the grey falcon and peregrine falcon to opportunistically fly over the application area, however no existing raptor or corvid nests were recorded during survey, and suitably sized trees were not abundant (SLR, 2024). Cliffs, large outcrop areas and major watercourses occur adjacent to the application area, therefore these species may utilise the application area as supporting habitat for hunting; however, it is unlikely to be utilised as breeding habitat (SLR, 2024).

The striated grasswren inhabits spinifex associated with rocky slopes and ridges, preferring areas of dense spinifex hummocks (Menkhorst *et al.*, 2017). This species was recorded 12 kilometres south of the application area in 2017 (SLR, 2024), including two records from 2004 and 2005 within 36 kilometres of the application area (GIS Database). There is potential for this species to occur within the application area due to suitable habitat, however habitat extends beyond the application area, it is unlikely this species will be significantly impacted by the proposed clearing. Impacts can be minimised with a slow directional clearing condition.

The oriental plover is a migratory species that breeds in China and Mongolia and visits Australia (SLR, 2024). The preferred habitat consists of grasslands and thinly vegetated plains, and open areas. Large flocks can be found on areas of wet ground associated with wetlands (Menkhorst *et al.*, 2017). The habitat within the application area may support foraging habitat for this species, however given the habitat extends beyond the application area and does not breed in Australia, it is unlikely this species will be significantly impacted by the proposed clearing.

### Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on conservation significant fauna and associated habitat can be managed by the implementation of restricted clearing zones to avoid critical habitat, slow directional clearing to allow fauna and to move into adjacent vegetation, watercourse management to avoid riparian vegetation, and rehabilitating the site post clearing activities to ensure the habitat is not permanently lost.

### Conditions

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

- undertake slow, progressive one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity;
- retain cleared vegetation and topsoil and respread this on a cleared area of equivalent size within the permit boundary within 12 months of clearing to ensure fauna habitat is not permanently lost;

- vegetation management – avoid riparian vegetation and where a watercourse is to be impacted by clearing, the permit holder shall ensure that the existing surface flow is maintained, or reinstated downstream into existing natural drainage lines; and
- restricted clearing condition to avoid critical habitat for conservation significant fauna species.

### 3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 19 April 2024 by the Department of Energy, 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 (WCD2007/001) over the area under application (DPLH, 2024). This claim has been determined by the Federal Court on behalf of the claimant group, Eastern Guruma. One Indigenous Land Use Agreement is registered between Hamersley Iron Pty Ltd and Eastern Guruma (WI2001/001). 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, 2024). 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.

Adjacent clearing permit application CPS 9985/1 relating the Silvergrass East – MAR scheme was previously received and assessed by DEMIRS. On 8 June 2023, the Environmental Protection Authority (EPA) advised DEMIRS that CPS 9985/1 application was constrained under section 41(3) of the *Environmental Protection Act 1986* (EPA, 2023). DEMIRS received subsequent response from the EPA on 9 April 2024 advising CPS 9985/1 and CPS 10569/1 are not constrained and Delegated Officer could proceed with decision (EPA, 2024).

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. Additional information provided by applicant

Summary of comments	Consideration of comment
Additional information provided by applicant on deep and shallow caves located within the application area.	Refer to 3.2.2.

## Appendix B. Site characteristics

### B.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia (GIS Database). The predominant land use in the region is grazing of native pastures, conservation and mining activity.
Ecological linkage and conservation areas	According to available databases, the application area does not contain any known or mapped ecological linkages, neither is it located within or in close proximity to any conservation areas (50 kilometres) (GIS Database).
Vegetation description	<p>The application area occurs within the Hamersley subregion of the Pilbara (PIL03) (GIS Database). The vegetation of the application area is broadly mapped as the following Beard vegetation associations (GIS Database):</p> <ul style="list-style-type: none"> <li>• <b>Hamersley 82:</b> Hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i> (209.62 ha / 52.3%)</li> <li>• <b>Hamersley 565:</b> Hummock grasslands, low tree steppe; bloodwood over soft spinifex (96.62 ha / 24.1%), and</li> <li>• <b>Hamersley 18:</b> Low woodland; mulga (<i>Acacia aneura</i>) (94.71 ha / 23.6%).</li> </ul> <p>A flora and vegetation survey was conducted over the application area by SLR during July, 2023. The following vegetation associations were recorded across three broad landforms within the application area (SLR, 2024):</p> <p><i>Drainage</i></p> <ul style="list-style-type: none"> <li>• <b>D1: ChAtpTe:</b> <i>Corymbia hamersleyana</i> and <i>Eucalyptus xerothermica</i> low isolated trees over <i>Acacia tumida</i> var. <i>pilbarensis</i> and <i>Gossypium robinsonii</i> tall open shrubland over <i>Themeda triandra</i> (<i>Paraneurachne muelleri</i>, <i>Eulalia aurea</i> and <i>Eulalia simonii</i>) low tussock to closed tussock grassland (2.79 ha/0.69%)</li> </ul> <p><i>Hills and slopes</i></p> <ul style="list-style-type: none"> <li>• <b>H1: EIIAtkTb:</b> <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> (<i>Corymbia hamersleyana</i>) low isolated trees over <i>Acacia atkinsiana</i> and <i>Acacia ancistrocarpa</i> mid to tall open shrubland over <i>Triodia basitricha</i> (<i>Triodia wiseana</i> and <i>Triodia epactia</i>) low open hummock grassland (3.24 ha / 0.81%).</li> <li>• <b>H2: EIIAaTspp:</b> <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> (<i>Corymbia hamersleyana</i>) low isolated trees over <i>Acacia inaequilatera</i> tall, isolated shrubs over <i>Acacia ancistrocarpa</i> (<i>Acacia maitlandii</i>) isolated patches of mid shrubs over <i>Gompholobium oreophilum</i> (<i>Corchorus lasiocarpus</i> subsp. <i>lasiocarpus</i>) isolated patches of low shrubs over a mosaic of <i>Triodia basitricha</i>, <i>Triodia epactia</i>, and <i>Triodia wiseana</i> low open hummock grassland (105.02 ha / 26.19%).</li> <li>• <b>H3: EIIAeTw:</b> <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> low isolated trees over <i>Acacia exigua</i> mid to tall open shrubland over <i>Mirbelia viminialis</i> low open shrubland over <i>Triodia wiseana</i> low open hummock grassland 1.61 ha / 0.40%).</li> <li>• <b>H4: EIIAmTe:</b> <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> low isolated trees over <i>Acacia monticola</i> and <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> tall open shrubland over <i>Indigofera rivularis</i> mid open shrubland over <i>Corchorus lasiocarpus</i> subsp. <i>lasiocarpus</i>, <i>Triumfetta maconochieana</i>, and <i>Walthera virgata</i> low isolated shrubs over <i>Triodia epactia</i> low open hummock grassland (1.90 ha / 0.47%).</li> <li>• <b>H5: EIIMvTspp:</b> <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> low isolated trees over a mosaic of <i>Acacia maitlandii</i> and <i>Mirbelia viminialis</i> (<i>Acacia ancistrocarpa</i>) mid isolated shrubs over <i>Acacia hilliana</i> (<i>Dampiera candidans</i>) low isolated shrubs over <i>Triodia basitricha</i> and <i>Triodia wiseana</i> low hummock to open hummock grassland (162.23 ha / 40.46%).</li> </ul> <p><i>Plains</i></p> <ul style="list-style-type: none"> <li>• <b>P1: AxEmber:</b> <i>Acacia xiphophylla</i> tall shrubland over <i>Eremophila maculata</i> subsp. <i>brevifolia</i> low isolated shrubs over <i>Enteropogon ramosus</i> low isolated tussock grasses (0.59 ha/0.15%).</li> <li>• <b>P2: ChEgTw:</b> <i>Corymbia hamersleyana</i> low isolated trees over <i>Eucalyptus gamophylla</i> tall open mallee shrubland over <i>Acacia atkinsiana</i> tall open shrubland over <i>Triodia wiseana</i> and <i>Triodia epactia</i> low hummock grassland (113.93 ha / 28.42%).</li> </ul> <p>Disturbed areas (9.65 ha / 2.41%) Vegetation mapping is available in Appendix E and representative photos are available in Appendix F.</p>
Vegetation condition	The vegetation survey (SLR, 2024) and aerial imagery indicate the vegetation within the proposed clearing area is in excellent to very good (Trudgen, 1991) condition with some areas in completely degraded condition, described as:

	<ul style="list-style-type: none"> <li>Excellent: Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.</li> </ul> <p>to</p> <ul style="list-style-type: none"> <li>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</li> </ul> <p>The vegetation within the application area is mostly in excellent to very good condition, with some areas considered completely degraded due to historically cleared areas (existing tracks and drill pads) and minor weed incursions. The full Trudgen (1991) condition rating scale is provided in Appendix D. Vegetation condition mapping is available in Appendix E.</p>
Climate and landform	The application area is mapped within elevations 550 to 600 metres Australian Height Datum (AHD) (GIS Database). The climate of the region is semi-arid to tropical with an annual rainfall average of approximately 312.4 millimetres recorded at Paraburdoo Aero (BoM, 2024; CALM, 2002).
Soil description and land degradation risk	The soil is mapped as part of the following landform systems (DPIRD, 2024; SLR, 2024; Van Vreeswyk, 2004): <ul style="list-style-type: none"> <li><b>Boolgeeda system (285Bg):</b> stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands. Stony lower plains consist of soil characterised as red loamy earths and stoney slopes and upper plains consist of red shallow loams or red loamy earths. This system covers roughly 174.39 (43.49%) hectares of the application area and is not susceptible to erosion.</li> <li><b>Newman system (285Ne):</b> rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands. Most of this system consists of stony soils, red shallow loams, red loamy earths and some red shallow sands. This system covers roughly 226.57 hectares (56.51%) of the application area and consists of erosional surfaces.</li> </ul>
Waterbodies and hydrogeography	There are no permanent watercourses or waterbodies within the application area, however, there are several ephemeral drainage lines (SLR, 2024; GIS Database). One major non-perennial river, Caves Creek occurs between two polygons of the application area (SLR, 2024; GIS Database). The application area is located within the Pilbara Ground Water Area and Pilbara Surface Water Area proclaimed under the <i>Rights in Water and Irrigation Act 1914</i> (GIS Database). The nearest Public Drinking Water Source Area is Millstream Water Reserve, which is located approximately 11.5 kilometres northeast of the application area. There are no Wetlands of International Importance or Nationally Important Wetlands that occur within the application area or surrounding area (50 kilometres) (GIS Database). The application area is located approximately 1.5 kilometres south of the Upper Robe River that is a Priority one area described in "Wild Rivers of Western Australia" (Water and Rivers Commission, 1999). The mapped groundwater salinity is 500-1,000 milligrams per litre total dissolved solids which is described as marginal (GIS Database).
Flora	There are no records of Threatened flora within the application area or local surrounds (50 kilometres) (SLR, 2024; GIS Database). There are records of two Priority flora within the application area and an additional 49 records of priority flora that occur in the local surrounds (50 kilometres) (SLR, 2024; GIS Database).
Ecological communities	There are records of one Threatened Ecological Community (TEC) and four Priority Ecological Communities (PEC) within 50 kilometres of the application area (GIS Database). <ul style="list-style-type: none"> <li>Themeda grasslands (<i>Themeda</i> sp. Hamersley Station (M.E. Trudgen 11431)) on cracking clays (Hamersley Station, Pilbara) (TEC - CR)</li> <li>Brockman Iron cracking clay communities of the Hamersley Range (P1)</li> <li>Riparian flora and plant communities of springs and river pools with high water permanence of the Pilbara Region (P2)</li> <li>Kumina Land System (P3)</li> <li><i>Triodia pisolitica</i> (previously <i>Triodia</i> sp. Robe River) assemblages of mesas of the West Pilbara (P3)</li> </ul> <p>Further details are outlined in Appendix B.4.</p>
Fauna	There are 31 conservation significant fauna likely to occur within the application area or local surrounds (SLR, 2024; GIS Database): <ul style="list-style-type: none"> <li>9 conservation significant fauna have a high likelihood of occurrence;</li> <li>5 conservation significant fauna have a medium likelihood of occurrence; and</li> <li>17 conservation significant fauna have a low likelihood of occurrence.</li> </ul>
Fauna habitat	Fauna habitat within the application area has been mapped into three types described as (SLR, 2024): <ul style="list-style-type: none"> <li><b>low hills and slopes:</b> with thin soils over shallow bedrock. Vegetation consists of low, isolated <i>Corymbia</i> and <i>Eucalyptus</i> trees over <i>Acacia</i> open shrubland midstorey over low <i>Triodia</i> hummock grassland. Common microhabitats include small <i>Triodia</i> hummocks, scree slopes, and occasional rock crevices which provide shelter for a variety of small fauna taxa. Microhabitat features include one deep cave and two shallow caves.</li> <li><b>stony plain:</b> with low, isolated <i>Corymbia</i> and <i>Eucalyptus</i> trees over <i>Acacia</i> open shrubland midstorey over low <i>Triodia</i> hummock grassland and tussock grassland. <i>Triodia</i> hummocks were the predominant microhabitat within this habitat type. These hummocks provide an</li> </ul>

important source of shelter, refuge, and nesting opportunities for small fauna taxa including birds, mammals, and reptiles.

- **minor drainage:** characterised by denser vegetation than surrounds. These displayed little to no evidence of surface water channelling and are likely to be inundated very infrequently. No permanent or semi-permanent water sources were recorded. Vegetation consists of low, isolated *Corymbia* and *Eucalyptus* trees over *Acacia* and *Gossypium* open shrubland midstorey over *Themeda triandra* tussock grassland and low *Triodia* hummock grassland. Key microhabitats include woody debris, leaf litter, peeling bark, and hummock/tussock grasslands which provide refuge, shelter, and foraging opportunities for a wide variety of fauna taxa.
- **disturbed areas**

Mapping of fauna habitat is provided in Appendix E. Representative photos are provided in Appendix G.

## B.2. Flora analysis table

Flora analysis of records within 75 kilometres of the application area and their likelihood of occurrence pre and post survey (SLR, 2024). Updates to Priority flora conservation status include but are not limited to the following species: *Aristida Lazaridis* (P3), *Eragrostis* sp. Mt Robinson (S. van Leeuwen 4109) (P3), *Euphorbia inappendiculata* var. *inappendiculata* (P3), *Euphorbia inappendiculata* var. *queenslandica* (P3), *Ipomoea racemigera* (P3) and *Oxalis* sp. Pilbara (M.E. Trudgen 12725) (P3).

Taxon	Database					Literature*					Distance to Nearest Record (km)	Flowering Period	Preferred Habitat	Pre-Survey Likelihood of Occurrence	Habitat occurs within the Survey Area (updated post survey)	Post-Survey Likelihood of Occurrence	Justification for change in likelihood
	Naturemap	RTIO	TPPL	WAHerb	Ecospage 2019	Rio Tinto 2019 <sup>2</sup>	Bioda 2019 <sup>3</sup>	Rio Tinto 2020 <sup>4</sup>	Bioda 2022 <sup>5</sup>								
<b>Priority 1</b>																	
<i>Aristida polyclados</i>										65	-	Red clay, Alluvial plains. <sup>6</sup>	Low	No	Low	-	
<i>Calotis squamigera</i>										18	Aug to Nov	Red clay, Alluvial plains. <sup>6</sup>	Low	No	Low	-	
<i>Helichrysum oligochaetum</i>										22	Aug to Nov	Alluvial plains. <sup>6</sup>	Low	No	Low	-	
<i>Hibiscus</i> sp. Mt Brockman (E. Thoma ET 1354)										11	-	Large Shaded rocky gullies <sup>6</sup>	Low	No	Low	-	
<i>Josephinia</i> sp. Woodstock (A.A. Mitchell PRP 989)										>80	-	Flat, Red-brown clay-loam. Gently inclined drainage line. <sup>6</sup>	Low	No	Low	-	
<i>Solanum</i> sp. W Hamersley Range (S. Colwill & B. Duncan LCR99-01)										48	-	Drainage shoulder and mudstone geology, shaded rocky gullies <sup>6</sup>	Low	No	Low	-	
<i>Tephrosia lithosperma</i>										72	-	Open stony plains and slopes <sup>6</sup>	Low	Yes	Low	-	
<i>Tetraloche butcheriana</i>										30	-	Ironstone rocky faces and cracks at high altitude <sup>6</sup>	Low	No	Low	-	
<i>Triodia luteana</i>										2.5	-	Orange shale hills <sup>6</sup>	Low	No	Low	-	
<i>Triodia veniciae</i>										68	-	Orange shale hills <sup>6</sup>	Low	No	Low	-	
<b>Priority 2</b>																	
<i>Aristida lazardis</i>										8	-	Mulga flats and clays <sup>6</sup>	Low	No	Low	-	
<i>Dicladanthera glabra</i>										60	Apr or Aug to Oct	Alluvium. Along watercourses, near rock pools. <sup>6</sup>	Low	No	Low	-	
<i>Eragrostis</i> sp. Mt Robinson (S. van Leeuwen 4109)										38	Sep	Red-brown skeletal soils, ironstone. Steep slopes, summits. <sup>6</sup>	Low	No	Low	-	
<i>Euphorbia inappendiculata</i> var. <i>inappendiculata</i>										3.5	May, Aug	Red, brown clay or loam. Plains. <sup>6</sup>	Low	No	Low	-	
<i>Euphorbia inappendiculata</i> var. <i>queenslandica</i>										3.5	May, Aug	Red, brown clay or loam. Plains. <sup>6</sup>	Low	No	Low	-	
<i>Gompholobium kanjini</i>										30	-	Orange shale hills and ironstone hills <sup>6</sup>	Low	No	Low	-	
<i>Hibiscus</i> aff. sp. Curimbiddy Range (M.E. Trudgen MET 15708)										1.2	-	Rocky hills and gullies <sup>6</sup>	Medium	No	Low	Large rocky hills and gullies habitat not present in Survey Area	
<i>Ipomoea racemigera</i>										1.2	Apr	On sandy soils along watercourses. <sup>6</sup>	Medium	No	Low	Larger drainages not present in Survey Area	
<i>Neptunia longipila</i>										67	-	Cracking clays and alluvial plains <sup>6</sup>	Low	No	Low	-	
<i>Oxalis</i> sp. Pilbara (M.E. Trudgen 12725)										8	-	Shaded ironstone faces and outcroppings, drainage <sup>6</sup>	Low	No	Low	-	
<i>Paspalum retigilume</i>										73	Apr	Cracking clays <sup>6</sup>	Low	No	Low	-	
<i>Pentalepis trichodesmoides</i> subsp. <i>hispidula</i>										20	-	Basalt boulder hills <sup>6</sup>	Low	No	Low	-	
<i>Scaevola</i> sp. Hamersley Range basalts (S. van Leeuwen 3675)										65	July to Aug	Skeletal, brown gritty soil over basalt. Summits of hills, steep hill. <sup>6</sup>	Low	No	Low	-	
<i>Teucrium pilbaricum</i>										4	May or Sep	Clay. Crab hole plain in a river floodplain, margin of calcareous table. <sup>6</sup>	Low	No	Low	-	
<b>Priority 3</b>																	
<i>Acacia dawsoni</i>										40	July - Sep	Stony red loamy soils. Low rocky rises, along drainage lines. <sup>6</sup>	Low	Yes	Low	-	
<i>Aristida jericohenis</i> var. <i>subspinulifera</i>										64	-	Hardpan plains. <sup>6</sup>	Low	Yes	Low	-	
<i>Astrelia lappacea</i>										4	-	Cracking clays <sup>6</sup>	Low	No	Low	-	
<i>Cyanthium gracile</i>										34	Apr - Oct	Rocky gully, ironstone outcropping. <sup>6</sup>	Low	No	Low	-	
<i>Dampiera anonyma</i>										26	-	Shale hills and hill slopes <sup>6</sup>	Low	No	Low	-	
<i>Dolichocarpa</i> sp. Hamersley Station (A.A. Mitchell PRP 1479)										4	May - Jul or Sep	Brown sandy clay, or medium clay. Claypans, drainage lines, cracking clays, crabhole plains. <sup>6</sup>	Low	No	Low	-	
<i>Eragrostis sureyana</i>										12	May - Sep	Soak areas, broad drainage areas, wet areas. <sup>6</sup>	Low	No	Low	-	
<i>Eremophila magnifica</i> subsp. <i>velutina</i>										2.5	-	Ironstone Rocky hills and gullies <sup>6</sup>	Medium	Yes	Low	Large rocky hills and gullies habitat not present in Survey Area	
<i>Euphorbia australis</i> var. <i>glabra</i>										0.3	May	Flat, red brown loam. <sup>6</sup>	Medium	No	Low	Cracking clay landform not present in Survey Area	
<i>Fimbristylis sieberiana</i>										1.3	May - Jun	Mud, skeletal soil pockets. Pool edges, sandstone cliffs. <sup>6</sup>	Low	No	Low	-	
<i>Geijera salicifolia</i>										68	Sep	Skeletal soils, stony soils. Massive rock scree, gorges. <sup>6</sup>	Low	No	Low	-	
<i>Glycine falcata</i>										0.3	May or Jul	Black clayey sand. Along drainage depressions in crabhole plains on river floodplains. <sup>6</sup>	Medium	No	Low	Cracking clay landform not present in Survey Area	
<i>Goodenia</i> sp. East Pilbara (A.A. Mitchell PRP 727)										40	Feb, Mar and May	Red-brown clay soil, calcareous pebbles. Low undulating plain, swampy plains. <sup>6</sup>	Low	No	Low	-	
<i>Grevillea saxicola</i>										11	-	Orange shale hills, ironstone hills <sup>6</sup>	Low	No	Low	-	
<i>Gymnanthera cunninghamii</i>										1	Jan - Dec	Sandy soils. Among drainage. <sup>6</sup>	Medium	Yes	Low	Larger drainages not present in Survey Area	
<i>Indigofera rivularis</i>										Within Survey Area	-	Ironstone gullies, drainage <sup>6</sup>	Recorded	Yes	Recorded	-	
<i>Iotasperra sessilifolium</i>										0.3	-	Cracking clays <sup>6</sup>	Low	No	Low	-	

Taxon	Database				Literature*					Distance to Nearest Record (km)	Flowering Period	Preferred Habitat	Pre-Survey Likelihood of Occurrence	Habitat occurs within the Survey Area (updated post survey)	Post-Survey Likelihood of Occurrence	Justification for change in likelihood
	Naturemap	RTO	TPFL	WAHerb	Ecocape 2013	Rio Tinto 2018	Biota 2019	Rio Tinto 2020	Biota 2022							
<i>Owenia acidula</i>			✓							69	-	Clay. <sup>6</sup>	Low	No	Low	-
<i>Ptilotus subspinescens</i>	✓	✓	✓	✓						10	-	Gentle rocky slopes, screes and the bases of screes. <sup>6</sup>	Medium	Yes	Low	habitat not present in Survey Area
<i>Rhagodia</i> sp. Hamersley (M. Trudgen 17794)	✓			✓	✓			✓		26	-	Red sandy loam over gravelly ironstone. Plains. <sup>6</sup>	Low	No	Low	-
<i>Rostelularia ascendens</i> var. <i>latifolia</i>	✓	✓		✓			✓			0.2	-	Clays, granite boulders. <sup>6</sup>	Medium	No	Low	habitat not present in Survey Area
<i>Sida</i> sp. Hamersley Range (K. Newbey 10692)	✓	✓	✓	✓			✓	✓		0.8	-	Rocky faces and shaded gullies. <sup>6</sup>	Medium	No	Low	Large rocky hills and gullies habitat not present in Survey Area
<i>Solanum albostellatum</i>				✓						58	Mar - May	Open clay flats, flat undulating plains, clay, cracking clay. <sup>6</sup>	Low	No	Low	-
<i>Solanum</i> sp. Red Hill (S. van Leeuwen et al. PBS 5415)	✓			✓						32	Mar - Oct	High in landscape, summit of hill, skeletal red brown gritty soil over Banded Iron Formation/shale. <sup>6</sup>	Low	No	Low	-
<i>Stackhousia clementii</i>				✓						55	Nov - Mar	Skeletal soils. Sandstone hills. <sup>6</sup>	Low	No	Low	-
<i>Streptoglossa</i> sp. Cracking clays (S. van Leeuwen et al. PBS 7353)		✓		✓				✓		62	-	Cracking clays. <sup>6</sup>	Low	No	Low	-
<i>Swinsona thompsoniana</i>	✓	✓		✓			✓	✓		0.1	-	Cracking clays. <sup>6</sup>	Medium	No	Low	Cracking clay landform not present in Survey Area
<i>Terminalia supranitfalia</i>		✓		✓						55	May or Jul or Dec	Sand. Among basalt rocks. Hill tops. <sup>6</sup>	Low	No	Low	-
<i>Themeda</i> sp. Hamersley Station (M.E. Trudgen 11431)	✓	✓		✓	✓		✓	✓		1.3	Aug	Flat sandplains. <sup>6</sup>	Medium	No	Low	Cracking clay landform not present in Survey Area
<i>Triodia basitricha</i>	✓	✓		✓			✓	✓			Within Survey Area	Stony ground, gravelly hill, crests, hills, in gorges. <sup>6</sup>	Recorded	Yes	Recorded	-
<i>Triodia pisolithicola</i>		✓		✓						17	Mar - Jun	Drainage depressions between the plain. Soils with clay patches. <sup>6</sup>	Low	Yes	Low	-
<i>Vittadina</i> sp. Coondewanna Flats (S. van Leeuwen 4684)	✓	✓	✓	✓			✓	✓		2	Jul	Flat plain. Red, brown sandy clay-loam. <sup>6</sup>	Medium	No	Low	Cracking clay landform not present in Survey Area
<b>Priority 4</b>																
<i>Acacia bromilowiana</i>	✓	✓		✓			✓			0.2	Jul - Aug	Red skeletal stony loam, orange-brown pebbly gravel loam, laterite, banded ironstone, basalt, Rocky hills, breakaways, scree slopes, gorges, creek beds. <sup>6</sup>	High	Yes	Medium	Large rocky hills and gullies habitat not present in Survey Area
<i>Eremophila magnifica</i> subsp. <i>magnifica</i>	✓	✓		✓			✓	✓		2	Aug - Nov	Skeletal soils over ironstone. Rocky screes. <sup>6</sup>	High	No	Low	Large rocky hills and gullies habitat not present in Survey Area
<i>Goodenia berriginensis</i>				✓				✓		40	Oct	Red sandy loam. Along watercourses. <sup>6</sup>	Low	No	Low	-
<i>Lepidium catapychon</i>	✓		✓					✓		35	Oct	Prime habitat includes stony hill slopes such as the uplands of the Hamersley Range plateau, open woodland in usually hilly areas, more frequently on south facing slopes, hill hummock grasslands, road verges and cuttings. <sup>6</sup>	Low	No	Low	-
<i>Livistona alfredii</i>	✓	✓		✓						12	Nov - Dec	Edges of permanent pools. <sup>6</sup>	Low	No	Low	-
<i>Ptilotus mollis</i>	✓	✓		✓			✓	✓		3.3	May or Sep	Stony hills and screes. <sup>6</sup>	Medium	No	Low	Large rocky hills and screes habitat not present in Survey Area
<i>Ptilotus trichocephalus</i>			✓	✓						55	Sep	Sandy soils. Colluvial plains. <sup>6</sup>	Low	No	Low	-
<i>Rhynchosia bungarensis</i>	✓	✓		✓			✓	✓		1.2	May - Dec	Pebbly, shingly coarse sand amongst boulders. Banks of flow line in the mouth of a gully in a valley wall. <sup>6</sup>	High	No	Low	Large rocky hills and gullies, or major drainage habitat not present in Survey Area
<i>Sida</i> sp. Barlee Range (S. van Leeuwen 1642)	✓		✓	✓						25	Aug	Skeletal red soils pockets. Steep slope. <sup>6</sup>	Medium	No	Low	Large rocky hills and gullies habitat not present in Survey Area

Additionally, through a search of available databases, one species was identified to occur within 50 kilometres of the application area (GIS Database).

Species name	Suitable habitat features?	Suitable vegetation type?	Suitable soil type?	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify?
<b>Priority 3</b>						
<i>Goodenia obscurata</i>	Y	Y	Y	<25 km	28	N

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

### B.3. Fauna analysis table

Fauna analysis of records within 75 kilometres of the application area and their likelihood of occurrence (SLR, 2024). Update to species name for the long-tailed dunnart from *Sminthopsis longicaudata* to *Antechinomys longicaudata*.

Family	Scientific Name	Common Name	Conservation Status		Source							Likelihood of Occurrence	Justification
			State	Commonwealth	NM	PMST	DBCA	ALA	RTIO	Literature			
<b>BIRDS</b>													
Acanthizidae	<i>Aphelocephala leucopsis</i>	Southern Whiteface	-	VU		x						Low	Survey Area occurs on the western extremity of the known distribution. <sup>1</sup> No nearby records identified from the database searches or literature. <sup>2</sup>
Accipitridae	<i>Erythrotriorchis radiatus</i>	Red Goshawk	VU	VU		x						Low	Taxon is only found in the Kimberly in WA. Survey Area is outside species distribution. <sup>1</sup>
Accipitridae	<i>Pandion haliaetus</i>	Osprey	MI	MI, MA	x		x					Low	One DBCA record 30 km west of the Survey Area from 2012. <sup>2</sup> No suitable habitat is present within the Survey Area (coastal, estuaries, large rivers, major rivers, wetlands, river pools). <sup>1,4</sup>
Apodidae	<i>Apus pacificus</i>	Pacific Swift, Fork-tailed Swift	MI	MI, MA		x		x	x	x		Low	The RTIO database identified one record, 36.6 km south in 2014. <sup>5</sup> Low to very high airspace over varied habitat. <sup>4</sup>
Charadriidae	<i>Charadrius veredus</i>	Oriental Plover	MI	MI, MA	x	x	x					Medium	Two DBCA records 30 km east of the Survey Area from 2018. <sup>2</sup> Suitable habitat is present within the Survey Area (grasslands, thinly vegetated plains). <sup>3</sup>
Falconidae	<i>Falco hypoleucos</i>	Grey Falcon	VU	VU	x	x	x		x	x		Medium	One DBCA record 37 km north of the Survey Area from 2018. <sup>2</sup> The RTIO database identified one record, 25.9 km east in 2020. <sup>5</sup> Suitable habitat is present in the Survey Area (open plains with treed watercourses in arid inland). <sup>3</sup>
Falconidae	<i>Falco peregrinus</i>	Peregrine Falcon	OS		x		x	x	x	x		High	Two DBCA records 28 km west of the Survey Area from 2012. <sup>2</sup> The RTIO database identified three records, including 0.3 km east in 2019 and 19.6 km south in 2019. <sup>5</sup> Suitable habitat is present in the Survey Area (preferred habitat consists of most environments with suitable nest sites: cliff faces, commonly uses stick nests built by other species). <sup>3</sup> May use the Survey Area for hunting.
Glareolidae	<i>Glareola maldivarum</i>	Oriental Pratincole	MI	MI, MA		x						Low	No nearby records identified from the database searches or literature. <sup>2</sup> Limited suitable habitat is present in the Survey Area (preferred habitat includes open plains, open areas around tidal flats, beaches, wetlands). <sup>4</sup>
Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow	MI	MI, MA		x						Low	No nearby records identified from the database searches or literature. <sup>2</sup> Typically occurs in coastal areas. <sup>3</sup> Forages over open country, often congregates in areas with high densities of flying insects. <sup>3</sup>
Maluridae	<i>Amytornis whitei</i>	Rufous Grasswren	P4 (listed as <i>A. striatus striatus</i> )		x		x	x		x		Medium	Two DBCA records 36 km south of the Survey Area from 2004 and 2005. <sup>2</sup> Suitable habitat is present in the Survey Area. Restricted to areas with spinifex associations, with or without shrubs or light tree cover, preferring areas with tall dense spinifex hummocks. <sup>3</sup> DBCA has advised that the taxon should still be treated as Priority 4 species pending further updates to the DBCA Threatened and Priority Fauna List (Amy Mutton pers. comm. 2022).
Motacillidae	<i>Motacilla cinerea</i>	Grey Wagtail	MI	MI, MA		x						Low	No nearby records identified from the database searches or literature. <sup>2</sup> No suitable habitat is present in the Survey Area (fresh sandy or rocky streams, mown grass, ploughed land, sewage ponds). <sup>4</sup>
Motacillidae	<i>Motacilla tschutschensis</i>	Eastern Yellow Wagtail	MI	MI, MA		x						Low	No nearby records identified from the database searches or literature. <sup>2</sup> No suitable habitat is present in the Survey Area (damp short grass flats, swamp edges, sewage ponds, mowed grass). <sup>1</sup>

Family	Scientific Name	Common Name	Conservation Status		Source						Likelihood of Occurrence	Justification	
			State	Commonwealth	NM	PMST	DBCA	ALA	RTIO	Literature			
Psittaculidae	<i>Pezoporus occidentalis</i>	Night Parrot	CR	EN		x						Low	No nearby records identified from the database searches or literature. <sup>2</sup> No suitable habitat present in the Survey Area (long unburnt spinifex and samphire shrublands bordering salt lakes). <sup>4</sup>
Psittaculidae	<i>Polytelis alexandrae</i>	Princess Parrot	P4	VU		x						Low	Suitable habitat is present; however, Survey Area is outside core distribution and species is unlikely to occur, may occur sporadically after good rains. <sup>3</sup>
Rostratulidae	<i>Rostratula australis</i>	Australian Painted Snipe	EN	EN, MA		x						Low	No suitable habitat is present in the Survey Area (well vegetated surrounds and shallows of wetlands). <sup>4</sup>
Scolopacidae	<i>Actitis hypoleucos</i>	Common Sandpiper	MI	MI, MA		x		x				Low	No nearby records identified from the database searches or literature. <sup>2</sup> No suitable habitat is present in the Survey Area (coastal and interior wetlands, narrow muddy edges of billabongs, river pools, mangroves, rocky beaches, estuaries, near-coastal salt lakes, lagoons, claypans, sewage ponds). <sup>1,4</sup>
Scolopacidae	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	MI	MI, MA		x						Low	No nearby records identified from the database searches or literature. <sup>2</sup> No suitable habitat present in the Survey Area (fresh and salt wetlands, muddy edges of lagoons, swamps, lakes, dams, soaks, sewage farms, temporary floodwaters). <sup>4</sup>
Scolopacidae	<i>Calidris ferruginea</i>	Curlew Sandpiper	CR	CR, MI, MA		x						Low	No nearby records identified from the database searches or literature. <sup>2</sup> No suitable habitat present in the Survey Area (inter-tidal mudflats of estuaries, lagoons, mangrove channels, dams, floodwaters, flooded saltbush surrounds of inland lakes). <sup>4</sup>
Scolopacidae	<i>Calidris melanotos</i>	Pectoral Sandpiper	MI	MI, MA		x						Low	No nearby records identified from the database searches or literature. <sup>2</sup> No suitable habitat is present in the Survey Area (coastal fresh to saline wetlands, inland permanent and temporary wetlands, mudflats, swamps with dense vegetation). <sup>4</sup>
Scolopacidae	<i>Calidris ruficollis</i>	Red-necked Stint	MI	MI, MA				x				Low	No suitable habitat is present in the Survey Area (tidal mudflats, saltmarshes, sandy or shelly beaches, saline and freshwater wetlands, coastal and inland, saltfields, sewage ponds). <sup>1</sup>
Scolopacidae	<i>Gallinago megala</i>	Swinhoe's Snipe	MI	MI, MA				x				Low	No suitable habitat is present in the Survey Area (wet grassy ground, edge of reedy swamps). <sup>1</sup>
<b>MAMMALS</b>													
Dasyuridae	<i>Dasyurus hallucatus</i>	Northern Quoll	EN	EN	x	x	x		x	x		Potentially Recorded	Three DBCA records 22 km south of the Survey Area from 2017. <sup>2</sup> One record from literature 12 km south of the Survey Area in 2017. <sup>6</sup> The RTIO database identified 740 records, including six records within 1 km of the Survey Area in 2019. <sup>5</sup> Suitable habitat present in the Survey Area (rocky escarpments, eucalypt forest, and woodland). <sup>7</sup>
Dasyuridae	<i>Sminthopsis longicaudata</i>	Long-tailed Dunnart	P4		x		x	x			x	Medium	Twelve DBCA records within 30 km of the Survey Area, including 5 km east of the Survey Area in 1998 and 5 km west of the Survey Area in 1998. <sup>2</sup> The most recent records were 28 km southwest of the Survey Area in 2017. <sup>2</sup> Suitable habitat present in the Survey Area (rugged, rocky areas in the arid zone: scree slopes, boulder and stony plateaus and adjacent stony plains with shrubs over spinifex hummock grasslands). <sup>9</sup>
Megadermatidae	<i>Macroderma gigas</i>	Ghost Bat	VU	VU	x	x	x	x	x	x		High	Twenty-two DBCA records within 35 km of the Survey Area, including 100 m east of the Survey Area in 2009. <sup>2</sup> The RTIO database identified 151 records, including 17 records within 200 meters of the Survey Area from 2019 to 2020. <sup>5</sup> Suitable cave habitat was identified within the Survey Area.

Family	Scientific Name	Common Name	Conservation Status		Source						Likelihood of Occurrence	Justification
			State	Commonwealth	NM	PMST	DBCA	ALA	RTIO	Literature		
Muridae	<i>Leggadina lakedownensis</i>	Short-tailed Mouse	P4		x		x	x	x	x	High	Thirty-four DBCA records within 26 km of the Survey Area, including 1 km southeast of the Survey Area in 2009 and a further 15 within 5 km as recent as 2009. <sup>2</sup> The RTIO database identified seven records, including 0.9 km southeast in 2009 and 2.3 km southeast in 2009. <sup>5</sup> Suitable semiarid areas in spinifex and tussock grasslands, <i>Acacia</i> shrublands, and stony ranges present in the Survey Area. <sup>8</sup>
Muridae	<i>Pseudomys chapmani</i>	Western Pebble-mound Mouse	P4		x		x	x	x	x	Recorded	Sixty-three DBCA records within 37 km of the Survey Area, including one 22 km west of the Survey Area in 1999 and 22 km south of the Survey Area in 2012. <sup>2</sup> The RTIO database identified 354 records, including inside the Survey Area in 2020 and 0.8 km north in 2020. <sup>5</sup> Suitable habitat present in the Survey Area (gentler slopes of rocky ranges covered by stony mulch and hard spinifex, often with a sparse overstorey of eucalypts and scattered shrubs). <sup>8</sup>
Rhinonycteridae	<i>Rhinonycteris aurantia</i> Pilbara form	Pilbara Leaf-nosed Bat	VU	VU	x	x	x		x	x	High	Eighty-seven DBCA records within 37 km of the Survey Area, including three inside the Survey Area in 2017 and one 600 m north of the Survey Area in 2017. <sup>2</sup> The RTIO database identified 114 records, including nine records within 200 meters of the Survey Area from 2016 to 2020. <sup>5</sup> Suitable cave habitat was identified within the Survey Area.
<b>REPTILES</b>												
Carpodactylidae	<i>Underwoodisaurus seorsus</i>	Pilbara Barking Gecko	P2				x			x	Medium	One DBCA record 37 km north of the Survey Area. <sup>2</sup> Suitable habitat present in the Survey Area (areas with spinifex and low tree cover). <sup>9</sup>
Pythonidae	<i>Liasis olivaceus barroni</i>	Pilbara Olive Python	VU	VU	x	x	x		x	x	High	Three DBCA records between 30 and 37 km of the Survey Area. <sup>2</sup> One record was recorded by literature 12 km south of the Survey Area in 2017. <sup>6</sup> The RTIO database identified 14 records, including 0.05 km from the Survey Area in 2019 and 0.14 km from the Survey Area in 2019. <sup>5</sup> No suitable habitat present in the Survey Area (permanent water sources, especially those associated with rocky areas). Transient individuals may pass through the Survey Area to water sources within the vicinity of the Survey Area). <sup>9</sup>
Scincidae	<i>Notoscincus butleri</i>	Lined Soil-crevice Skink	P4		x		x	x	x	x	High	Thirty DBCA records within 34 km of the Survey Area, including 100 meters from the Survey Area in 2009 and 7 km west of the Survey Area in 1995. <sup>2</sup> The RTIO database identified 19 records, including 0.1 km east in 2009 and 2.3 km south in 2018. <sup>5</sup> Suitable habitat present within the Survey Area (associated with spinifex-dominated areas near creek and river margins). <sup>9</sup>
Typhlopidae	<i>Anilius ganei</i>	Gane's Blind Snake	P1						x	x	High	No DBCA records, two records from literature, including 12 km south in 2017 and 67 km east in 2014. <sup>6,10</sup> The RTIO database identified four records, including 1.6 km east in 2019 and 19.6 km west in 2019. <sup>5</sup> Limited suitable habitat present in the Survey Area (associated with moist gorges and valleys). <sup>9</sup>

## B.4. Ecological community analysis table

Conservation significant ecological communities within 50 kilometres of the application area (SLR, 2024; GIS Database).

Community name	Suitable habitat features?	Suitable vegetation type?	Suitable soil type?	Distance of closest record to application area (km)	Are surveys adequate to identify?
<b>Critically endangered</b>					
Themeda grasslands ( <i>Themeda</i> sp. Hamersley Station (M.E. Trudgen 11431)) on cracking clays (Hamersley Station, Pilbara)	N	N	N	<1 km	Y
<b>Priority 1</b>					
Brockman Iron cracking clay communities of the Hamersley Range	N	N	N	<1 km	Y
<b>Priority 2</b>					
Riparian flora and plant communities of springs and river pools with high water permanence of the Pilbara Region	N	N	N	<1 km	Y
<b>Priority 3</b>					
Kumina Land System	N	N/A	N	<37 km	Y
<i>Triodia pisolitica</i> (previously <i>Triodia</i> sp. Robe River) assemblages of mesas of the West Pilbara	N	N	N	<38 km	Y

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

## Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
<b>Environmental value: biological values</b>		
<p><b>Principle (a):</b> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u> The area proposed to be cleared contains two conservation significant flora species.</p>	At variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><b>Principle (b):</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."</p> <p><u>Assessment:</u> The area proposed to be cleared contains critical habitat for conservation significant fauna.</p>	At variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><b>Principle (c):</b> "Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."</p> <p><u>Assessment:</u> The area proposed to be cleared is unlikely to contain flora species listed under the BC Act.</p>	Not likely to be at variance	No
<p><b>Principle (d):</b> "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."</p> <p><u>Assessment:</u> There are no Threatened Ecological Communities have been recorded within the application area; however, 'Themeda grasslands on cracking clays (Hamersley Station)' listed as Critically Endangered under the BC Act 2016 is located within one kilometre from the application area (SLR, 2024). The vegetation within the application area is not likely to represent this TEC.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<b>Environmental value: significant remnant vegetation and conservation areas</b>		
<p><b>Principle (e):</b> "Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."</p> <p><u>Assessment:</u> The extent of the mapped vegetation type is consistent with the national objectives and targets for biodiversity conservation in Australia. The current extent of</p>	Not likely to be at variance	No



Assessment against the clearing principles	Variance level	Is further consideration required?
<p>vegetation associations remaining (Government of Western Australia, 2019):</p> <ul style="list-style-type: none"> <li>• Hamersley 82: 99.5% (2,550,888.14 ha)</li> <li>• Hamersley 565: 99.99% (108,945.16 ha)</li> <li>• Hamersley 18: 99.3% (671,843.35 ha)</li> </ul> <p>The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area (GIS Database).</p>		
<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>Given the distance to the nearest conservation area (GIS Database), the proposed clearing is not likely to have an impact on the environmental values of any nearby conservation areas.</p>	Not likely to be at variance	No
<b>Environmental value: land and water resources</b>		
<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>There are no permanent waterbodies or watercourses within the application area, however, the application area presents several ephemeral drainage lines and is situated adjacent to Caves Creek (GIS Database). The mapped vegetation within the application growing in association with drainage lines consists of minor gullies and thin channels dominated by low trees of <i>Corymbia hamersleyana</i>, and tall shrubs of <i>Acacia tumida</i> var. <i>pilbarensis</i> (SLR, 2024). This vegetation covers approximately 2.79 hectares of the application area and not considered to be a groundwater dependent ecosystem (SLR, 2024). Potential impacts this vegetation can be minimised with the implementation of a watercourse management condition.</p>	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 Boolgeeda and Newman land systems are generally not susceptible to water or land degradation, (Van Vreeswyk, 2004). The applicant management measures outlined the area will be reprofiled to reflect previously undisturbed landform then ripped on the contour to prevent erosion (Hamersley Iron Pty Ltd, 2024b). The proposed clearing is not likely to have an impact on land degradation and potential impacts can be minimised with the implementation of a rehabilitation condition.</p>	Not likely to 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>Given no watercourses, wetlands or Public Drinking Water Sources Areas are recorded within the application area, the proposed clearing is unlikely to impact surface or ground water quality.</p> <p>The proponent declared to be in accordance of the Ministerial Condition (MS 925), which states that the implementation of the MAR scheme is planned to maintain groundwater levels of the underlying aquifer at Caves Creek (Narraminju) to prevent long-term impacts to groundwater dependent vegetation communities adjacent to the Silvergrass East Iron Ore Mine (Hamersley Iron, 2022).</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>Localised flooding occurs seasonally in the region after intense rainfall (CALM, 2002). Major drainage and major rocky gullies were excluded from the application area (SLR, 2024). Caves Creek occurs adjacent to the application area, however, is a non-perennial watercourse and relies on rainfall events to flow (Rio Tinto, 2024). There is potential for minor increases in runoff in surrounding low-lying areas given topography, however given the extent of clearing, it is unlikely to significantly increase the incidence or intensity of flooding.</p>	Not likely to be at variance	No

## Appendix D. 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 E. Mapping of various features in the application area

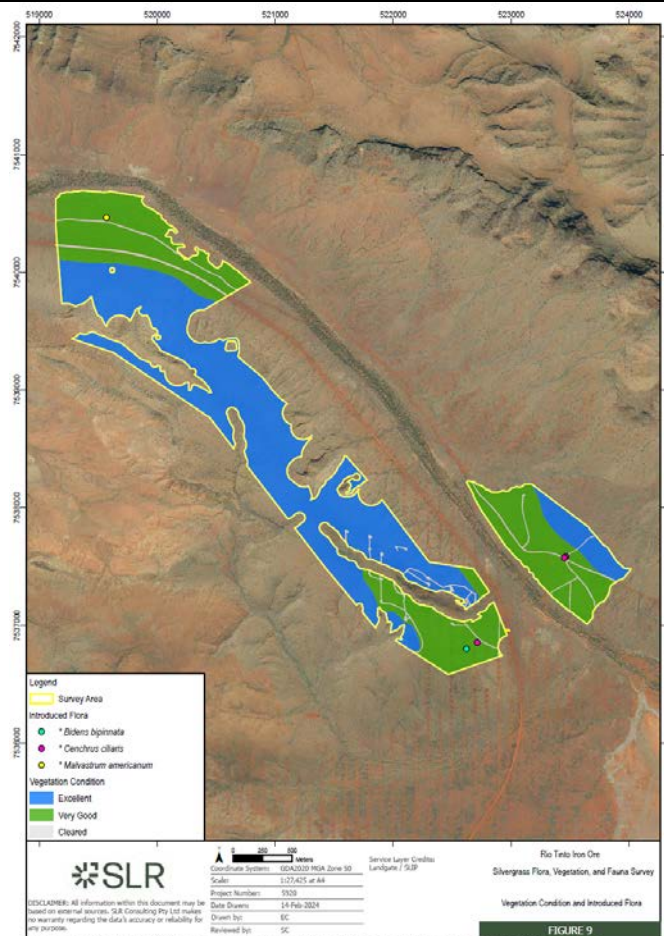


Figure 2. Map of vegetation condition and weed species (SLR, 2024).

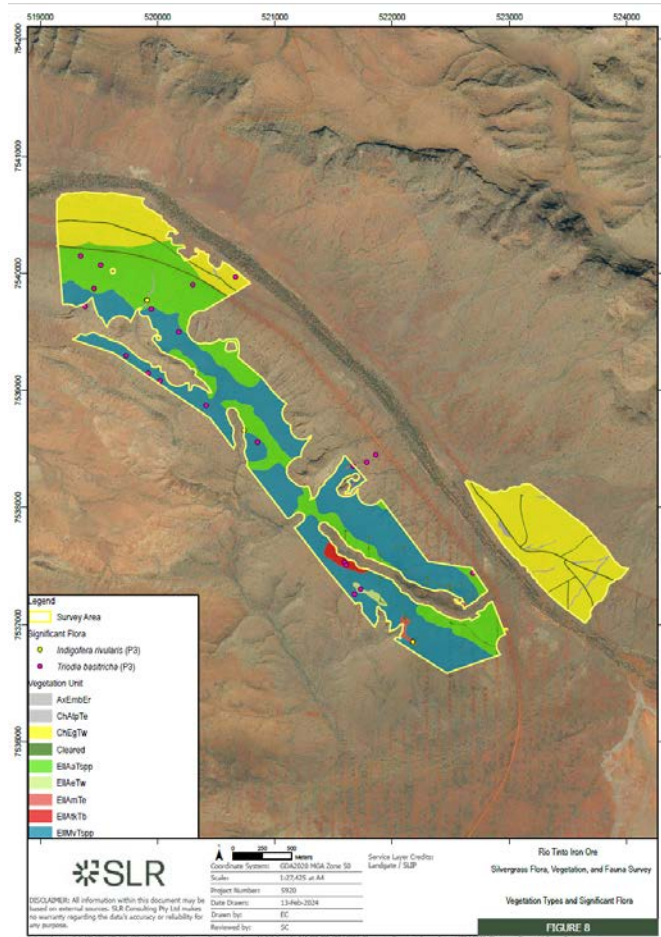


Figure 3. Map of vegetation types and priority flora species (SLR, 2024).

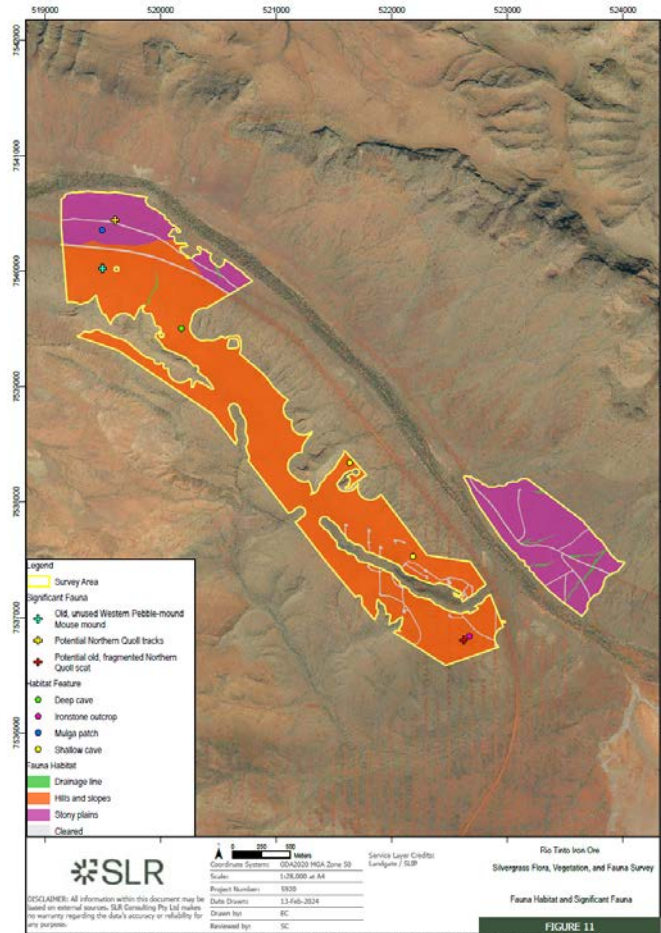


Figure 4. Map of fauna habitat types and secondary evidence of conservation significant fauna (SLR, 2024).



Photo 1: Drainage: D1: ChAtpTe (SLR, 2024).



Photo 2: Hills and slopes: H1: EIIAtkTb (SLR, 2024).

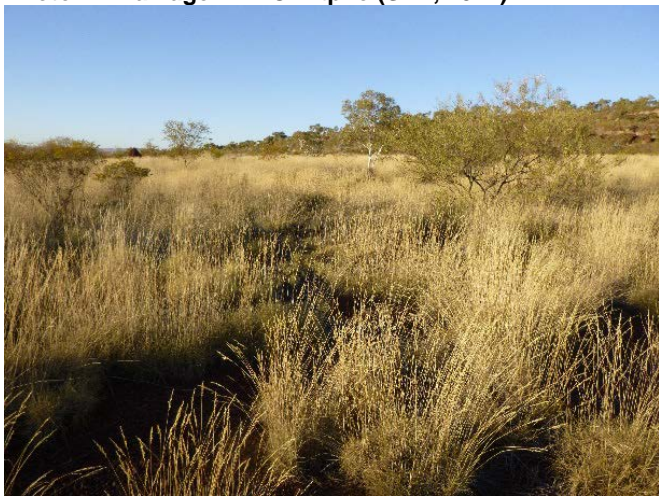


Photo 3: Hills and slopes: H2: EIIAaTsp (SLR, 2024).



Photo 4: Hills and slopes: H3: EIIAeTw (SLR, 2024).



Photo 5: Hills and slopes: H4: EIIAmTe (SLR, 2024).



Photo 6: Hills and slopes: H5: EIIMvTsp (SLR, 2024).



Photo 7: Plains: P1: AxEmbEr (SLR, 2024).



Photo 8: Plains: P2: ChEgTw (SLR, 2024).

**Appendix G. Photographs of fauna habitat types and caves within the application area**



Photo 9: Deep cave (SLR, 2024).



Photo 10: Shallow cave 1 (SLR, 2024).

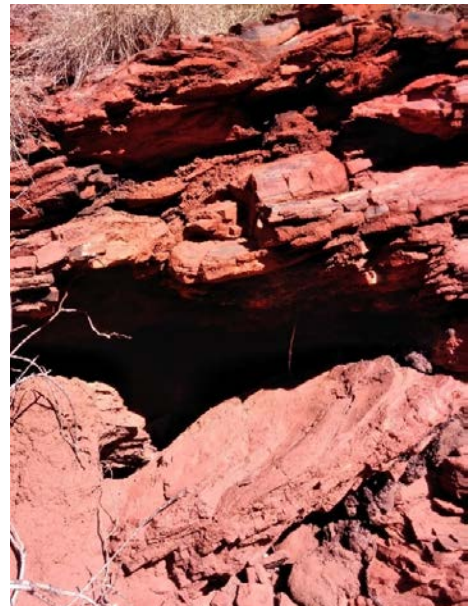


Photo 11: Shallow cave 2 (SLR, 2024).



Photo 12: Fauna habitat: Low hills and slopes (SLR, 2024).



Photo 13: Fauna habitat: stony plain (SLR, 2024).



Photo 14: Fauna habitat: minor drainage (SLR, 2024).

## Appendix H. Sources of information

### H.1. GIS databases

Publicly available GIS Databases used (sourced from [www.data.wa.gov.au](http://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)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Native Title (ILUA) (LGATE-067)
- Pre-European Vegetation Statistics
- 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)

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## 4. Glossary

### Acronyms:

<b>BC Act</b>	<i>Biodiversity Conservation Act 2016</i> , Western Australia
<b>BoM</b>	Bureau of Meteorology, Australian Government
<b>DAA</b>	Department of Aboriginal Affairs, Western Australia (now DPLH)
<b>DAFWA</b>	Department of Agriculture and Food, Western Australia (now DPIRD)
<b>DCCEEW</b>	Department of Climate Change, Energy, the Environment and Water, Australian Government
<b>DBCA</b>	Department of Biodiversity, Conservation and Attractions, Western Australia
<b>DEMIRS</b>	Department of Energy, Mines, Industry Regulation and Safety
<b>DER</b>	Department of Environment Regulation, Western Australia (now DWER)
<b>DMIRS</b>	Department of Mines, Industry Regulation and Safety, Western Australia (now DEMIRS)
<b>DMP</b>	Department of Mines and Petroleum, Western Australia (now DEMIRS)



<b>DoEE</b>	Department of the Environment and Energy (now DCCEEW)
<b>DoW</b>	Department of Water, Western Australia (now DWER)
<b>DPaW</b>	Department of Parks and Wildlife, Western Australia (now DBCA)
<b>DPIRD</b>	Department of Primary Industries and Regional Development, Western Australia
<b>DPLH</b>	Department of Planning, Lands and Heritage, Western Australia
<b>DRF</b>	Declared Rare Flora (now known as Threatened Flora)
<b>DWER</b>	Department of Water and Environmental Regulation, Western Australia
<b>EP Act</b>	<i>Environmental Protection Act 1986</i> , Western Australia
<b>EPA</b>	Environmental Protection Authority, Western Australia
<b>EPBC Act</b>	<i>Environmental Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
<b>GIS</b>	Geographical Information System
<b>ha</b>	Hectare (10,000 square metres)
<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
<b>PEC</b>	Priority Ecological Community, Western Australia
<b>RIWI Act</b>	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
<b>TEC</b>	Threatened Ecological Community

### **Definitions:**

{DBCA (2023) 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 the species of fauna that are listed as critically endangered, endangered or vulnerable threatened species.

**Threatened flora** is the species of flora that are listed as critically endangered, endangered or vulnerable threatened species.

The assessment of the conservation status of threatened species is in accordance with the BC Act listing criteria and the requirements of [Ministerial Guideline Number 1](#) and [Ministerial Guideline Number 2](#) that adopts the use of the International Union for Conservation of Nature (IUCN) [Red List of Threatened Species Categories and Criteria](#), and is based on the national distribution of the species.

**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.

**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.

**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.

**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).

**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.

**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).

Migratory species include birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) or 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.

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

Species of special conservation need that are 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).

Currently only fauna are listed as species of special conservation interest.

**OS Other specially protected species**

Species 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).

Currently only fauna are listed as species otherwise in need of special protection.

**P Priority species:**

Priority is not a listing category under the BC Act. The Priority Flora and Fauna lists are maintained by the department and are published on the department's website.

All fauna and flora are protected in WA following the provisions in Part 10 of the BC Act. The protection applies even when a species is not listed as threatened or specially protected, and regardless of land tenure (State managed land (Crown land), private land, or Commonwealth land).

Species that may possibly be threatened species that do not meet the criteria for listing under the BC Act because of insufficient survey 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 prioritisation for survey and evaluation of conservation status so that consideration can be given to potential listing as threatened.

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

Assessment of priority status 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 – known from few locations, none on conservation lands**

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, for example, 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 for threatened listing and appear to be under immediate threat from known threatening processes. These species are in urgent need of further survey.

**P2 Priority Two - Poorly-known species – known from few locations, some on conservation lands**

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, for example, 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 for threatened listing and appear to be under threat from known threatening processes. These species are in urgent need of further survey.

**P3 Priority Three - Poorly-known species – known from several locations**

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. These species need 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 a conservation dependent specially protected species.

(c) Species that have been removed from the list of threatened species or lists of conservation dependent or other specially protected species, during the past five years for reasons other than taxonomy.

(d) Other species in need of monitoring.

**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.