Department of Mines, Petroleum and Exploration

GOVERNMENT OF WESTERN AUSTRALIA

Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	10707/1
Permit type:	Purpose Permit
Applicant name:	Saturn Metals Limited
Application received:	1 August 2024
Application area:	197 hectares
Purpose of clearing:	Mineral production and associated activities
Method of clearing:	Mechanical Removal
Tenure:	Mining Lease 31/486
	Mining Lease 39/296
	Miscellaneous Licence 31/93
Location (LGA areas):	Shire of Leonora and Shire of Menzies
Colloquial name:	Apollo Hill Pilot Project

1.2. Description of clearing activities

Saturn Metals Limited proposes to clear up to 197 hectares of native vegetation within a boundary of approximately 756 hectares, for the purpose of mineral production and associated activities (Saturn Metals Limited, 2024; Talis Consultants, 2024). The project is located approximately 50 kilometres southeast of Leonora, within the Shire of Leonora and Shire of Menzies (Saturn Metals Limited, 2024; Talis Consultants, 2024).

The application is to allow for the development of the Apollo Hill Gold Pilot Project, which includes two open pits, a heap leach facility, a waste rock landform and other supporting infrastructure (Saturn Metals Limited, 2024).

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	31 July 2025
Decision area:	197 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) (now DMPE) 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 F), supporting information provided by the applicant (Appendix A), the vegetation of the application area (Appendix E), 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 Delegated Officer also took into consideration allow for the development of the Apollo Hill Gold Pilot Project (Saturn Metals Limited, 2024).

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;
- potential impacts to the local subterranean fauna community;
- the loss of native vegetation that is suitable habitat for southern whiteface (*Aphelocephala leucopsis*);
- the loss of riparian vegetation and potential impacts to surface and groundwater quality; and
- potential land degradation in the form of wind and water erosion.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (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 applicant has suitably demonstrated avoidance and minimisation measures (Section 3.1).

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;
- flora management (avoid identified priority flora with a buffer of ten metres);
- prior to any clearing, engage a botanist to conduct a targeted flora survey for the presence of *Angianthus prostratus*. The species will be flagged and a ten metre buffer will be erected to ensure the preservation of identified individuals;
- where practicable, avoid clearing riparian vegetation;
- inspect suitable southern whiteface nesting trees within the application area for hollows, and avoid hollow bearing trees;
- avoid impacting surface water flows; and
- commence construction no later than three months after undertaking clearing to reduce the risk of erosion.

1.5. Site map

The boundary of the areas authorised to be cleared is shown in the maps below (Figures 1 to 6).

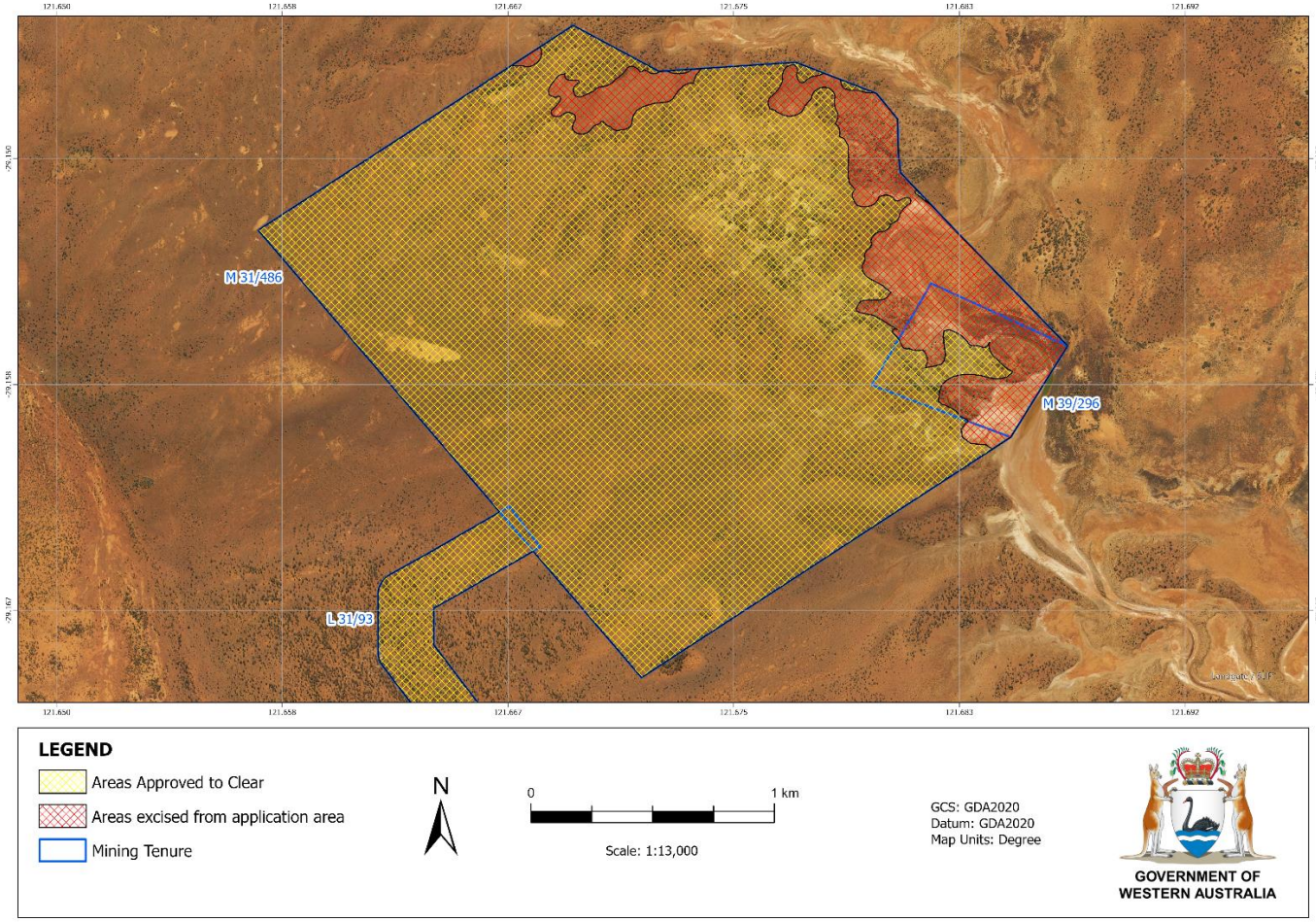

Figure 1. Map of Area 1. The yellow crosshatched area indicates the area within which conditional authorised clearing can occur under the granted clearing permit. The red crosshatched area indicates areas which have been removed from the application area. Explanation of the removed areas is provided in Section 3.1.

Figure 2. Map of Area 2. The yellow crosshatched area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.

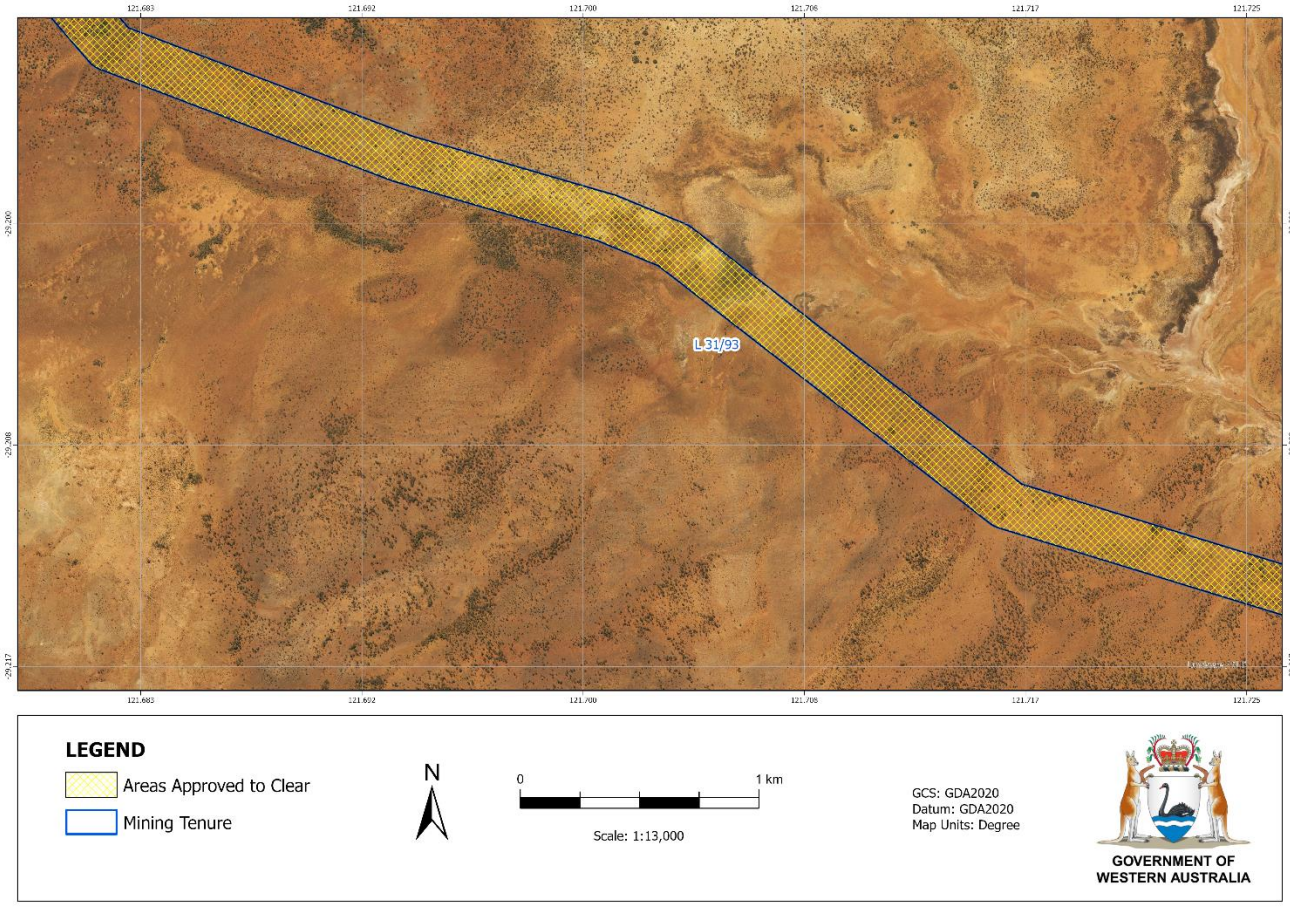

Figure 3. Map of Area 3. The yellow crosshatched area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.

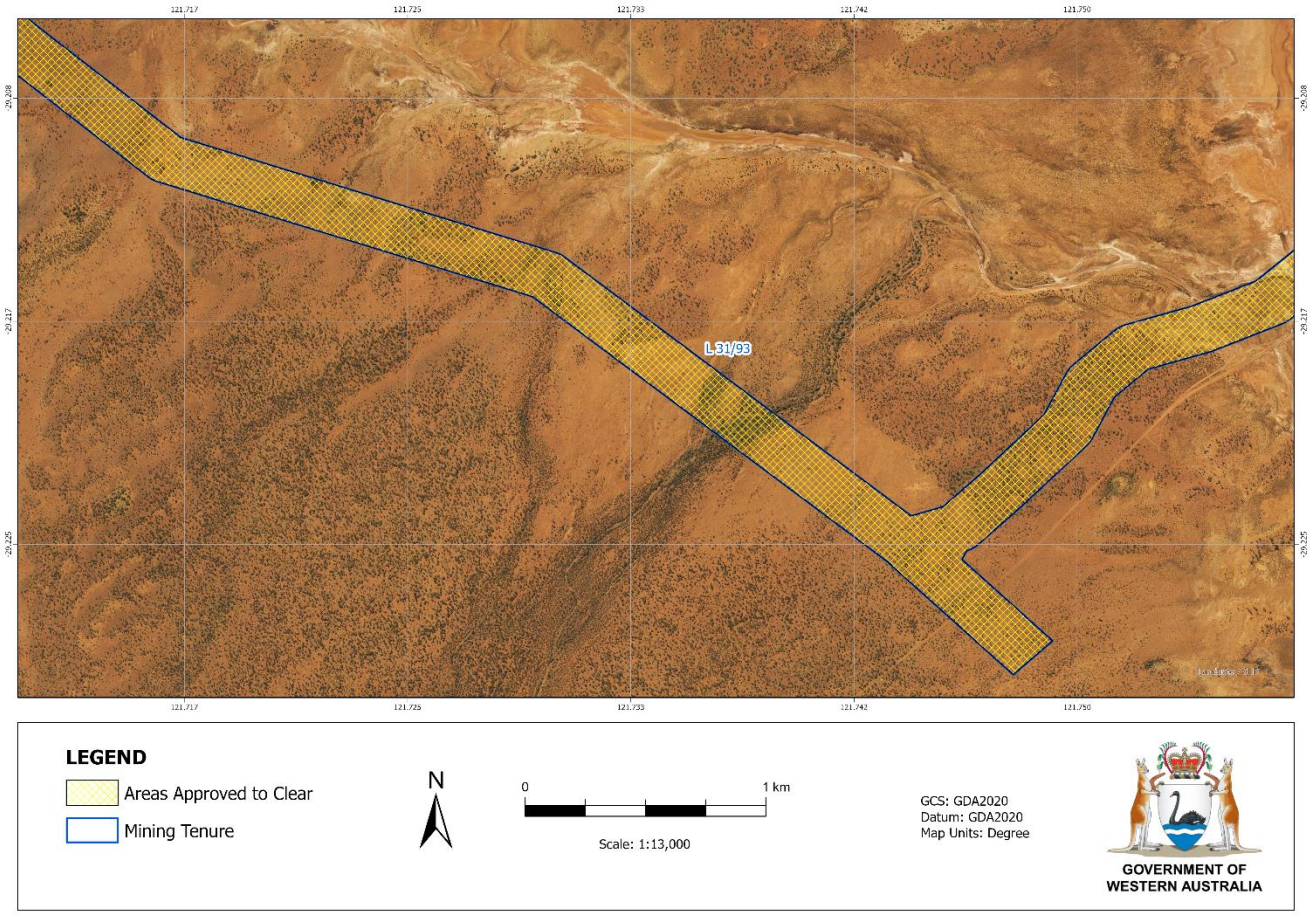

Figure 4. Map of Area 4. The yellow crosshatched area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.

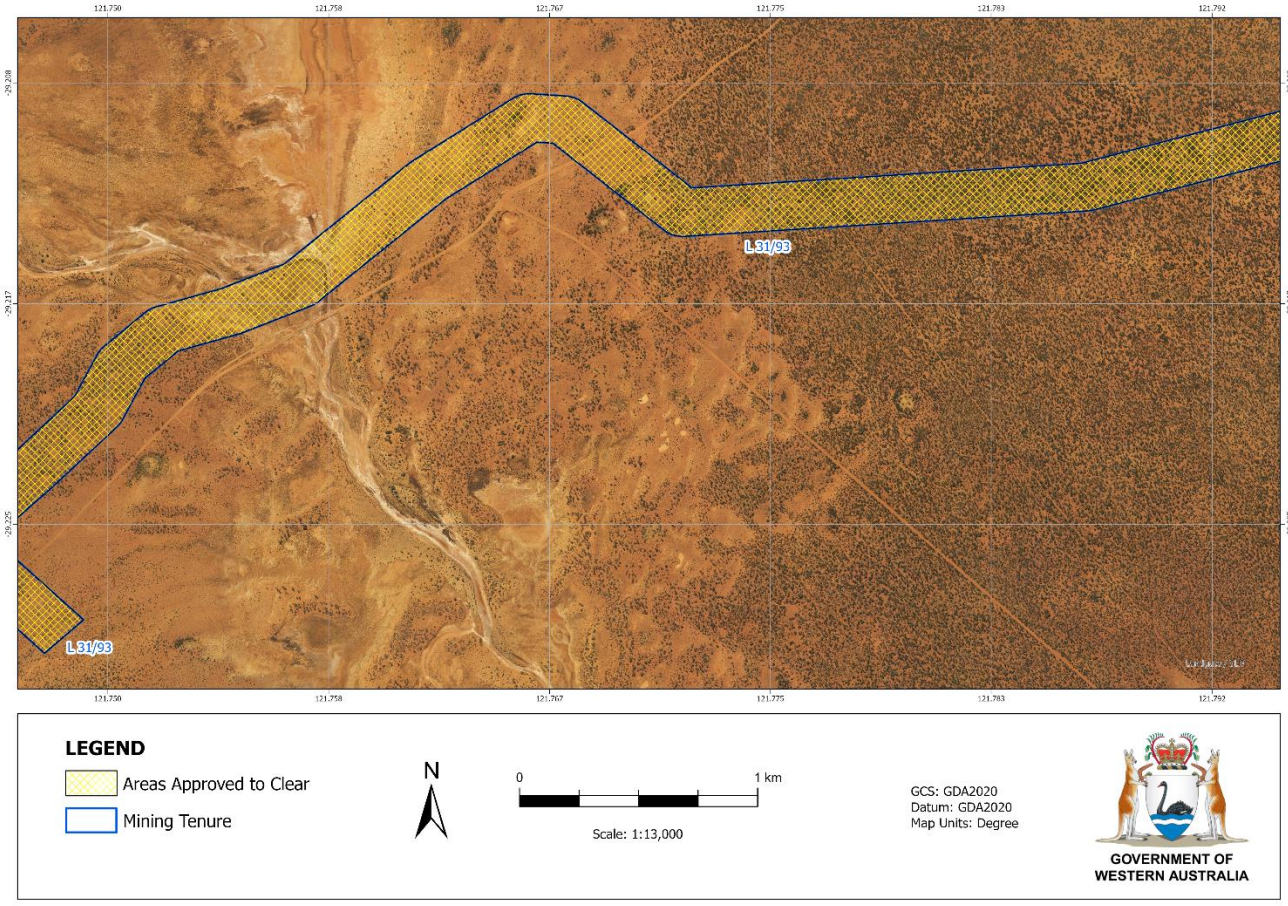

Figure 5. Map of Area 5. The yellow crosshatched area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.

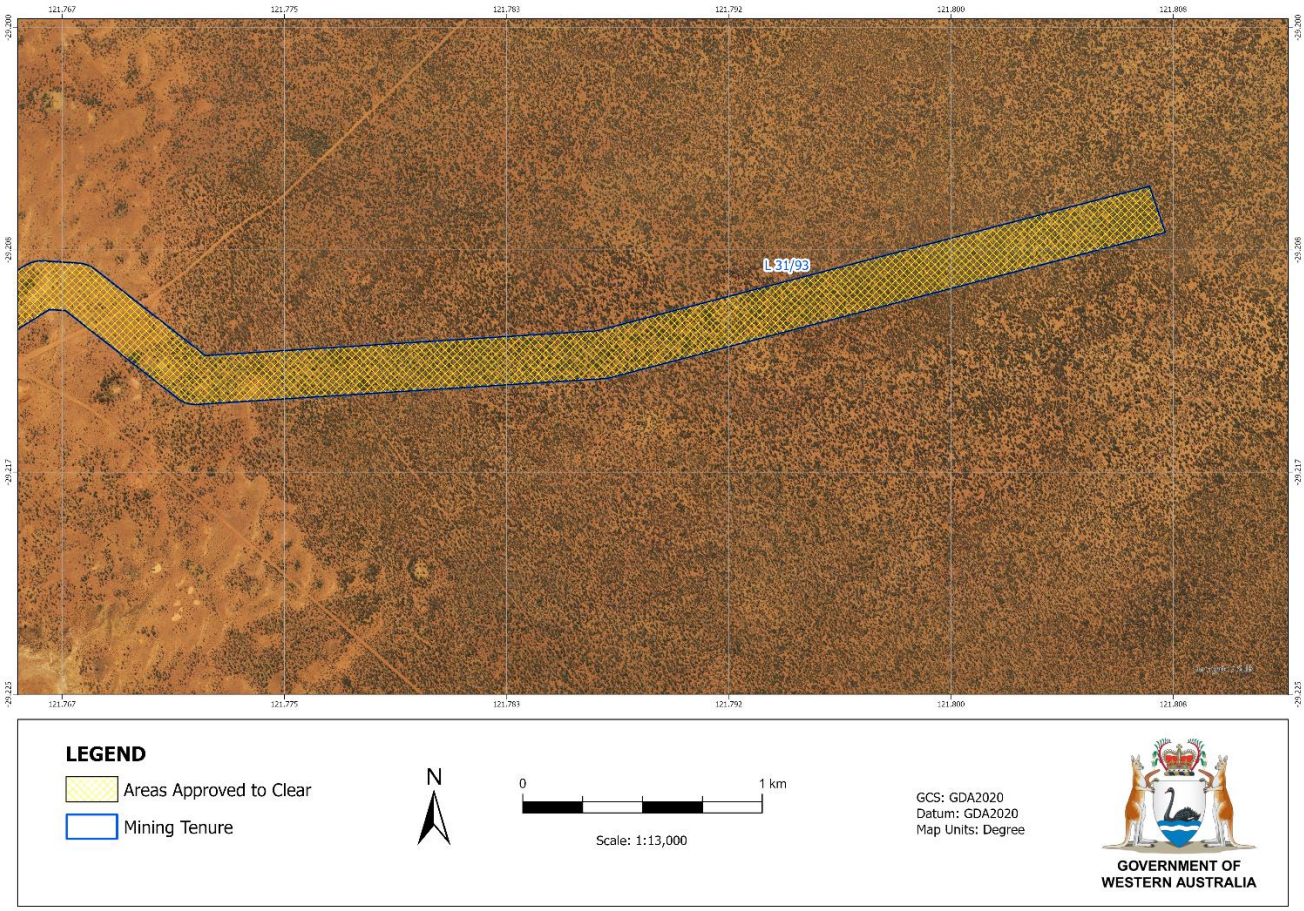

Figure 6. Map of Area 6. The yellow crosshatched area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.

2. Legislative context

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

In addition to the matters considered in accordance with section 51O of the EP Act (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)
- *Mining Act 1978* (WA)

Relevant agreements (treaties) considered during the assessment include:

- Japan-Australia Migratory Bird Agreement
- China-Australia Migratory Bird Agreement
- Republic of Korea-Australia Migratory Bird Agreement

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 original application was for the clearing of 197 hectares of native vegetation within a boundary of approximately 811 hectares. During the assessment the scope of the clearing was reviewed, and the clearing boundary was reduced to 756 hectares. The clearing boundary was revised and reduced to minimise the amount of significant habitat within the application

area, by excising salt lakes and floodplains (7.7 hectares), 31.7 hectares of the Tspp vegetation unit, and rocky escarpment habitat in good or very good condition (15.3 hectares). Changes to the clearing boundary are shown in Figure 1.1 of Section 1.5.

Additionally, the applicant submitted the following avoidance and mitigation measures:

- Minimise clearing;
- Design of project to avoid known areas of Priority Flora species occurrence where possible;
- Induction of personnel to cover any potential Priority flora species within the work areas;
- Induction of personnel to cover Weeds of National Significance, and their threats to environmental values;
- Inspection of vehicles prior to entry to the project area and ensure vehicles are clean of plant materials before entering undisturbed areas onsite;
- Undertake weed removal where necessary;
- Demarcating the area to be cleared;
- Inspection of demarcated clearing area prior to clearing by a qualified environmental practitioner;
- Dust suppression activities (such as the usage of water trucks) to be undertaken when required;
- Limit clearing activities during high wind conditions;
- Maintain surface water flow through the use of culverts;
- Progressive rehabilitation of cleared areas where possible; and
- Preclearance survey for malleefowl mounds (Talis Consultants, 2024).

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.

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 (flora; subterranean fauna and Ecological Communities; and terrestrial and aquatic fauna). 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 Principle (a)

Assessment

***Hemigenia exilis* (Priority 4)**
Hemigenia exilis (Priority 4) inhabits lateritic soils on breakaways, slopes and plains (Western Australian Herbarium, 1998-). *Hemigenia exilis* is known from 23 records within the Murchison bioregion (Western Australian Herbarium, 1998-). The Ecoscape (2024) survey identified one *Hemigenia exilis* population of ten plants, located along a sandy drainage line within the EcAbPd vegetation unit (locations shown in Figure 7 of Appendix F). Three individuals are located within the application area and could be impacted by the proposed clearing (Ecoscape, 2024). As three out of the ten specimens in the local population are potentially impacted by the proposed clearing, that the population is restricted to a drainage line, and this population is at the southern extent of the species range, the proposed clearing may result in a significant impact to this species at a local level (Ecoscape, 2024).

***Tecticornia globulifera* (Priority 1)**
Tecticornia globulifera (Priority 1) inhabits a variety of soil types on salt lakes and floodplains (Western Australian Herbarium, 1998-). One *Tecticornia globulifera* population, with 34 plants, was recorded on a samphire dominated saltmarsh within the Ecoscape (2024) survey area (locations shown in Figures 8 to 11 of Appendix G). *Tecticornia globulifera* is known from 23 records and has not previously been recorded within the Murchison bioregion, with the nearest records over 300 kilometres away (Ecoscape, 2024; Western Australian Herbarium, 1998-; GIS Database). The records within the application area constitute a substantial range extension (Ecoscape, 2024). The proposed clearing may result in a significant impact to this species at a local and regional level.

However, as 31.7 hectares (34.7 percent) of the Tspp vegetation unit was excised from the application area during assessment, all but one occurrence of *Tecticornia globulifera* is avoided within the revised application area.

***Angianthus prostratus* (Priority 3)**
Angianthus prostratus (Priority 3) inhabits red clay or loamy soils on saline depressions (Western Australian Herbarium, 1998-). As suitable habitat for this species occurs within the application area, it is considered potentially occurring (Ecoscape, 2024). *Angianthus prostratus* is known from 10 records within the Murchison and Avon Wheatbelt bioregions, with the nearest record less than seven kilometres from the application area (Western Australian Herbarium, 1998-; GIS Database). This species was not detected during flora surveys; however, it was unlikely to be detected due to poor seasonal conditions during the Ecoscape (2024) surveys. Habitat for *Angianthus prostratus* is represented within the Tspp vegetation unit (Ecoscape, 2024).

31.7 hectares (34.7 percent) of the Tspp vegetation unit was excised from the application area during assessment (Section 3.1). Following changes to the application area, 59.7 hectares of suitable *Angianthus prostratus* habitat remains within the application area (Ecoscape, 2024).

***Nicotiana salina* (Priority 1)**
Nicotiana salina (Priority 1) inhabits salt lakes (Western Australian Herbarium, 1998-). Suitable habitat for this species occurs within the application area (Ecoscape, 2024; GIS Database). As this species was not included in the Ecoscape (2024) desktop assessment, it is unlikely that it was specifically targeted in surveys. Therefore, this species is considered potentially occurring.

However, as salt lakes and floodplain habitat were excised from the application area during assessment, the revised likelihood of occurrence is low.

Other flora of interest
In the flora and vegetation survey by Ecoscape (2024) four *Tecticornia* taxa could not be confirmed to a species level, due to insufficient diagnostic material, or not aligning with a currently described species. Of these, *Tecticornia* sp. nov 2 did not match any other Western Australian Herbarium Collections and may represent a new species (Ecoscape, 2024). This taxa was recorded within the Tspp vegetation unit on a floodplain within the application area (Ecoscape, 2024). By excising 31.7 hectares of the Tspp vegetation unit from the application, the occurrence of this taxa has been avoided (Ecoscape, 2024; Section 3.1).

Santalum spicatum (Australian sandalwood) was recorded in the flora and vegetation survey by Ecoscape (2024). Taking of sandalwood is legislated under the BC Act. A clearing permit issued under the EP Act gives authority to clear sandalwood (DBCA, 2025).

Conclusion
Based on the above assessment, the proposed clearing may result in the clearing of habitat and individuals of *Hemigenia exilis* and *Tecticornia globulifera*, and the clearing of potential habitat for *Angianthus prostratus* and *Nicotiana salina*. Impacts to *Tecticornia* sp. nov 2 have been avoided by excising habitat from the application area. Impacts to *Santalum spicatum* do not require further consideration.

As *Hemigenia exilis* occurs within drainage lines, it is considered that the impacts of the proposed clearing on *Hemigenia exilis* can be managed by avoiding the clearing of the species and avoiding the clearing of riparian vegetation.

The potential impact to *Tecticornia globulifera* has been reduced by excising habitat and 33 known occurrences from the application area. Residual impact can be reduced by avoiding the clearing of the species.

The potential impact to *Angianthus prostratus* has been reduced by excising habitat 31.7 hectares of suitable habitat from the application area. However, as surveys were not adequate for the detection of this species, and 59.7 hectares of suitable *Angianthus prostratus* habitat remains within the application area, a pre-clearance survey is recommended for this species.

As *Nicotiana salina* habitat has been excised from the application area, *Nicotiana salina* is considered unlikely to occur. Therefore, the species is unlikely to be significantly impacted by the proposed clearing.

Conditions
To address the above impacts, the following management measures will be required as conditions on the clearing permit:
- flora management (avoid identified priority flora with a buffer of ten metres);
- prior to any clearing, a botanist shall be engaged to conduct a targeted flora survey for the presence of *Angianthus prostratus*. The species will be flagged and a ten metre buffer will be erected to ensure the preservation of identified individuals; and
- where practicable, avoid clearing riparian vegetation.

3.2.2. Biological values (subterranean fauna and Ecological Communities) - Clearing Principles (a), (b) and (d)

Assessment

The application area lies on calcrete geology, adjacent to a salt lake chain, ideal habitat for supporting high biodiversity subterranean fauna communities (Bennelongia, 2023b; Ecoscape, 2024; Humphreys, 2001; Humphreys et al., 2009). The subterranean fauna survey identified 14 stygofauna species and four troglofauna species, including three stygofauna species only known from the project area and two troglofauna species only known from the project area (Bennelongia, 2023b). Clearing is a threat to high biodiversity subterranean fauna communities, via changes to the water table depth (Humphreys, 2001). The clearing of phreatophytes – which are deep-rooted, groundwater dependent species – is more likely to influence the water table depth than other vegetation or species (Benyon et al., 1999; DPIE, 2025; Dzikiti et al., 2016; Zalesny et al., 2021). Eucalyptus species, including *Eucalyptus camaldulensis*, which was recorded in the application area, are common phreatophytes (Ecoscape, 2024; Zalesny et al., 2021). Clearing within groundwater dependent vegetation unit EcAbPd, characterised by *Eucalyptus camaldulensis* subsp. *arida*, may result in changes to the water table depth (Ecoscape, 2024). This vegetation unit has a total area of 2.6 hectares within the application area (Ecoscape, 2024).

The nearest threatened ecological community (TEC) (Depot Springs stygofauna community) and the nearest priority ecological community (PEC) (Melita calcrete groundwater assemblage type on Raeside palaeodrainage on Melita (Sons of Gwalia) Station, Priority 1 PEC) to the application area are both subterranean fauna communities (DBCA, 2023a; GIS Database). Both of these communities are upstream of the application area, and form part of the Raeside palaeodrainage channel, or its tributaries (DBCA, 2023b; GIS Database). However, within paleochannels there are discrete populations of subterranean fauna, with a high rate of speciation, and none of the species representative of the Depot Springs stygofauna community TEC were recorded in the subterranean fauna survey (Bennelongia, 2023b; Cooper et al., 2002; DBCA, 2023b). Due to this, the TEC and PEC are unlikely to occur within the application area.

Conclusion
Due to the small extent of clearing within groundwater dependent vegetation unit EcAbPd, it is unlikely that the local subterranean fauna community will be impacted by the proposed clearing. However, impacts of the proposed clearing on the local subterranean fauna community can be further managed by avoiding the clearing of riparian vegetation (EUCLID, 2020; Western Australian Herbarium, 1998-).

Subterranean fauna TECs and PECs are unlikely to occur within the application area and are therefore unlikely to be impacted by the proposed clearing.

Conditions

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

- where practicable, avoid clearing riparian vegetation.

3.2.3. Biological values (terrestrial and aquatic fauna) - Clearing Principles (a) and (b)

Assessment

Southern whiteface

Aphelocephala leucopsis (southern whiteface), Vulnerable, was listed under the EPBC Act in March 2023 (Commonwealth of Australia, 2008). Habitat for the southern whiteface includes open woodlands and shrublands, including areas dominated by acacias, eucalypts, or saltbush, on ranges, foothills and lowlands, and plains (BirdLife Australia, 2025b; DCCEEW, 2023). The habitat type represents 527.3 hectares of southern whiteface suitable habitat within the application area (Ecoscape, 2024). The mulga woodland, chenopod shrubland, drainage line and mixed shrubland habitat types represent 707.1 hectares of southern whiteface suitable habitat within the application area (Animalia, 2025; BirdLife Australia, 2025b; Ecoscape, 2024; DCCEEW, 2023).

Critical habitat for the species includes undisturbed habitats, areas with dense litter for foraging, and tree hollows for nesting and roosting (DCCEEW, 2023). It is recommended that areas of critical habitat are not cleared, as habitat loss and fragmentation is the biggest threat to the species (DCCEEW, 2023). The application area contains only sparse leaf litter, indicating it is not preferred foraging habitat (DCCEEW, 2023; Ecoscape, 2024). However, the application area contains trees with hollows suitable for nesting, indicating that the application area may be critical habitat for southern whiteface (Ecoscape, 2024; Westerhuis et al., 2019). Additionally, southern whiteface was recorded in the fauna survey, outside of the application area (Ecoscape, 2024).

Long-tailed dunnart

Sminthopsis longicaudata (long-tailed dunnart), Priority 4, occurs on rocky outcrops of central Western Australia (IUCN, 2015). Within the application area, 64.3 hectares of rocky escarpment habitat have been identified as suitable for the species (Ecoscape, 2024). However, the majority (76.2 percent) of this habitat is in 'poor' or worse condition, with 65.5 percent classified as 'very poor' (Ecoscape, 2024; Trudgen, 1991). *S. longicaudata* is unlikely to persist in the degraded portions of the habitat, as the species shows a preference towards habitats with higher structural complexity (Ecoscape, 2024; Integrate Sustainability, 2021).

During the assessment process, 15.3 hectares (23.7 percent) of rocky escarpment habitat (comprising all areas in 'good' or 'very good' condition) were excised from the application area (Ecoscape, 2024; Trudgen, 1991; Section 3.1). The remaining 49.0 hectares of habitat is degraded (Ecoscape, 2024). Species within the *Sminthopsis* genus are known for their high mobility and transient behaviour, which enables them to opportunistically exploit available habitat patches (Friend et al., 1997). As such, the removal of degraded habitat is unlikely to significantly impact the species, as individuals are capable of relocating into nearby areas of higher habitat quality.

Fairy shrimp

Branchinella simplex (fairy shrimp), Priority 1, inhabits saline lakes in inland Western Australia (Lawrie et al., 2021; Timms, 2008; 2009). A *Branchinella simplex* population can develop quickly in temporary waters following inundation, from resting eggs (La Trobe University, n.d.). Suitable habitat for this species occurs within the application area (Ecoscape, 2024; GIS Database). This species was not included in surveys, as it was outside of the scope, being an invertebrate species (Ecoscape, 2024). Therefore, this species is considered potentially occurring.

However, as salt lakes and floodplain habitat were excised from the application area during assessment, the revised likelihood of occurrence is low.

Black-eared cuckoo

Chalcites osculans (Black-eared Cuckoo), Marine, was recorded within the application during the fauna survey conducted by Ecoscape (2024). The cuckoo is highly mobile and found in a range of habitats, including open woodlands, shrublands, and occasionally farmlands and urban areas (NSW TSSC, 2020). Species breeding is reliant on availability of nests of host bird species, primarily speckled warbler (*Chthonicola sagittate*) and redthroat (*Pyrrholaemus brunneus*) (NSW TSSC, 2020). Other potential hosts include the shy heathwren (*Calamanthus cautus*), striated fieldwren (*Calamanthus fuliginosus*), rufous fieldwren (*Calamanthus campestris*) and the chestnut-rumped heathwren (*Calamanthus pyrrhopygius*) (NSW TSSC, 2020). None of the potential host species were recorded in the fauna survey (Ecoscape, 2024).

Peregrine falcon

Falco peregrinus (peregrine falcon), Other Specially Protected, is a migratory species. Within their global range, peregrine falcons can be found in a variety of habitats, including mountains, forests, cities, valleys, deserts, and coastlines (NWF, n.d.). This species may use the application area as a wider home range, however the area is not considered critical habitat.

Malleefowl

Leipoa ocellata (malleefowl), Vulnerable, occurs within arid and semi-arid woodland south of the 26th parallel (DEC, n.d.). No evidence of malleefowl was recorded during the survey, but suitable foraging/dispersal habitat for malleefowl occurs within the application area but (Ecoscape, 2024). Malleefowl require a sandy substrate and abundant leaf litter to build their incubator nests (DCCEEW, 2024). The application area contains only sparse leaf litter, indicating it is not preferred breeding habitat (DCCEEW, 2024; Ecoscape, 2024).

Migratory birds and hooded plover
Common sandpiper (*Actitis hypoleucos*), common greenshank (*Tringa nebularia*), Pacific golden plover (*Pluvialis fulva*) and sharp-tailed sandpiper (*Calidris acuminata*) are migratory bird species which may occur within the application area (GIS Database; Appendix B.4). Suitable habitat for these species, as well as the hooded plover (*Charadrius cucullatus*) includes inland wetlands and salt lakes (BirdLife Australia, 2025a; Commonwealth of Australia, 2008). The chenopod shrubland and flood plain habitats are seasonally inundated, providing suitable habitat for migratory wetland bird species (Ecoscape, 2024). Therefore, the application area contains a total of 84.9 hectares of suitable habitat for the above listed species. However, as the application area is part of an extensive salt lake system, suitable foraging habitat is widespread in the surrounding area (GIS Database).

Greater stick-nest rat
Leporillus conditor (greater stick-nest rat), Vulnerable, inhabits shrublands, particularly with succulent or semi-succulent plant species (DEWHA, 2008). The greater stick-nest rat populations only exist in managed reintroduction sites, with feral predators managed at these sites (DEWHA, 2008). As the application area is not a predator managed reserve or reintroduction site, it is unlikely that the greater stick-nest rat occurs within the application area.

Short range endemic (SRE) fauna
A short range endemic (SRE) fauna survey was conducted over 14-17 March 2023 by Bennelongia (2023a). The survey recorded no Confirmed SREs or Likely Potential SREs within the application area (Bennelongia, 2023a). No species recorded in the survey are expected to be restricted to the application area (Bennelongia, 2023a).

Conclusion

Species potentially impacted by the proposed clearing:

- **Southern whiteface:** hollow forming trees, that may provide critical nesting habitat, occur within the application area. The impacts of the proposed clearing on southern whiteface can be managed by inspecting suitable southern whiteface nesting trees within the application area for hollows, and avoiding hollow bearing trees.

The applicant may have notification responsibilities under the EPBC Act for impacts to southern whiteface and their habitats, as set out in the EPBC Act. The applicant has been advised to contact the federal Department of Climate Change, Energy, the Environment and Water (DCCEEW) to discuss EPBC Act referral requirements.

Species unlikely to be impacted by the proposed clearing:

- **Long-tailed dunnart:** as ideal habitat has been excised from the application area, and the species is mobile, it is unlikely to be impacted by the proposed clearing, if it were to occur within the application area.
- **Fairy shrimp:** as habitat has been excised from the application area, the species is unlikely to occur, and is therefore unlikely to be impacted by the proposed clearing.
- **Black-eared cuckoo:** as this species is highly mobile, the host species were not detected, and suitable habitat is abundant in the surrounding area, the proposed clearing is unlikely to impact the black-eared cuckoo.
- **Peregrine falcon:** as there is no critical habitat within the application area, this species is highly mobile, and suitable habitat is abundant in the surrounding area, the proposed clearing is unlikely to impact the peregrine falcon.
- **Malleefowl:** as the application area does not contain breeding habitat, and suitable foraging/dispersal habitat is abundant in the surrounding area, the proposed clearing is unlikely to impact malleefowl.
- **Migratory birds and hooded plover:** as these species are highly mobile and suitable habitat is widespread in the surrounding area, the proposed clearing is unlikely to impact these species (BirdLife Australia, 2025a; Commonwealth of Australia, 2008).
- **Greater stick-nest rat:** unlikely to occur within the application area, and therefore unlikely to be impacted by the proposed clearing.
- **Short range endemic (SRE) fauna:** the proposed clearing is unlikely to pose a significant impact to invertebrate species (Bennelongia, 2023a).

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

- inspect suitable southern whiteface nesting trees within the application area for hollows, and avoid hollow bearing trees.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 11 February 2025 by the Department of Energy, Mines, Industry Regulation and Safety (now DMPE) inviting submissions from the public. No submissions were received in relation to this application.

There is one native title claim (WCD2023/002 - Nyalpa Pirniku) over the area under application (DPLH, 2025). This claim has been determined by the Federal Court on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are two registered Aboriginal Sites of Significance (Place 2708 and Place 39771) within the application area (DPLH, 2025). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

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

Other relevant authorisations required for the proposed land use include:

- A Programme of Work approved under the *Mining Act 1978*.
- A Mining Proposal / Mine Closure Plan approved under the *Mining Act 1978*.

It is the proponent's responsibility to liaise with the Department of Water and Environmental Regulation and the Department of Biodiversity, Conservation and Attractions, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

End

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
The applicant is aware of the presence of Sandalwood (*Santalum spicatum*) within the application area. The applicant intends to avoid the clearing of Sandalwood. If disturbance of Sandalwood (*Santalum spicatum*) is required, the applicant may apply for a Sandalwood Taking (harvesting) License. The applicant plans to liaise with the Wangkatja Tjungula Aboriginal Corporation RNTBC as an interest in non-commercial customary purposes has been communicated to the applicant.	This information provided was considered during the assessment of Principle (a).
Amendment of the application to reduce the clearing boundary.	Avoidance and minimisation measures were considered in making a decision for this application.

Appendix B. Site characteristics

B.1. Site characteristics

Characteristic	Details
Local context	The application area is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. It is located within the Eastern Murchison subregion of the Murchison bioregion (Talis Consultants, 2024; GIS Database). The application area is within the Glenorn Pastoral Lease. It is also surrounded by predominantly goldmining operations. Approximately 99% of the local area (50 kilometre radius from the application area) remains uncleared (GIS Database).
Ecological linkage	According to available databases the application area does not form part of mapped ecological linkages. However, the application area intersects watercourses and waterbodies that form part of the Lake Raeside extensive salt lake system (GIS Database). This lake system likely constitutes an informal ecological linkage.
Conservation areas	The application area is not located within any DBCA legislated conservation areas (GIS Database). The nearest legislated conservation area is an unnamed nature reserve approximately 32.5 kilometres southwest of the application area (GIS Database).
Vegetation description	The vegetation of the application area is broadly mapped as the following Beard vegetation associations: • 389: Mulga, other wattle, *Casuarina, Atriplex* spp. *Maireana* spp. with *Acacia aneura*, *A. papyrocarpa, Allocasuarina cristata*; • 18: Mulga *Acacia aneura* and associated species; and • 125: salt lake (GIS Database). A flora and vegetation survey was conducted over the application area by Ecoscape (2024) during the following periods: • 27 March to 10 April 2023; • 4 to 11 September 2023; and • 18 to 22 September 2023. The following vegetation associations were recorded within the application area: • AaEmRd; • AaAePo; • AcEfPo; • AdMsMt; • AkLs; • AlAb; • AmFs; • CsLs; • EcAbPd; • Mp; • PaHpCs; • Tspp; and • Cleared land (Ecoscape, 2024). Detailed descriptions of vegetation types are provided in Appendix E.
Vegetation condition	The vegetation survey (Ecoscape, 2024) indicates the vegetation within the proposed clearing area is in very good to completely degraded (Trudgen, 1991) condition, with the majority of the application area in very good (Trudgen, 1991) condition, described as: • **Very good:** Some relatively slight signs of damage caused by human activities since European settlement.

<table>
<tr><th>Characteristic</th><th>Details</th></tr>
<tr><td></td><td>

Good: More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure.
Poor: Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement.
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.
Completely degraded: Areas that are completely or almost completely without native species in the structure of their vegetation.

The full Trudgen (1991) condition rating scale is provided in Appendix D.
</td></tr>
<tr><td>Climate and landform</td><td>
The climate of the Murchison bioregion is described as arid, with the nearest weather station (Kookynie) recording an average rainfall of approximately 239.1 millimetres per year (BoM, 2025; CALM, 2002).
The application area is mapped at elevations of 340-374 metres Australian height datum (GIS Database). Apollo Hill represents the highest point within the application area (Talis Consultants, 2024). Land system mapping broadly describes the application area as plains, salt lakes and low hills (DPIRD, 2025).
</td></tr>
<tr><td>Soil description</td><td>
The soils within the application area are broadly mapped as the following (DPIRD, 2025; Talis Consultants, 2024; GIS Database):
<table>
<tr><th>Land system</th><th>Description</th></tr>
<tr><td>279Ca (Carnegie)</td><td>Salt lakes with fringing saline alluvial plains, kopi dunes and sandy banks, supporting halophytic shrublands and acacia tall shrublands.</td></tr>
<tr><td>279Le (Leonora)</td><td>Low greenstone hills and stony plains supporting mixed chenopod shrublands.</td></tr>
<tr><td>279Ju (Jundee)</td><td>Hardpan plains with variable gravelly mantles and minor sandy banks supporting weakly groved mulga shrublands.</td></tr>
<tr><td>279Yo (Yowie)</td><td>Sandy plains supporting tall shrublands of mulga and bowgada with patchy wanderrie grasses.</td></tr>
</table>
</td></tr>
<tr><td>Land degradation risk</td><td>
Soils of the Leonora and Carnegie systems are susceptible to water erosion in areas of concentrated water flow (Pringle, 1994). As a major watercourse intercepts the application area within the Carnegie and Leonora systems, water erosion is likely to occur within the application area following rainfall events (GIS Database).
Clearing in the Carnegie system increases the likelihood of wind erosion (Pringle, 1994).
Soils of the Yowie and Jundee systems are not susceptible to erosion (Pringle, 1994).
The Jundee system is susceptible to vegetation death due to water starvation if natural surface water flows are disrupted (Pringle, 1994).
</td></tr>
<tr><td>Waterbodies</td><td>The application area intercepts a non-perennial lake, and several major and minor non-perennial watercourses, which are part of the Lake Raeside extensive salt lake system (GIS Database).</td></tr>
<tr><td>Hydrogeography</td><td>
The application area is not within any mapped Public Drinking Water Source Areas (PDWSA) or legislated surface water areas. The nearest PDWSA is the Leonora Water Reserve located approximately 46.5 kilometres to the northwest of the application area (GIS Database).
The application area is located within the Goldfields Groundwater Area proclaimed under the Rights in Water and Irrigation Act 1914 (GIS Database).
The groundwater salinity of the application area has been measured as being 44,000-120,000 milligrams per litre total dissolved solids, which is considered hypersaline (Talis Consultants, 2024).
</td></tr>
<tr><td>Flora</td><td>The desktop assessment located 27 conservation significant flora species recorded within a 50 kilometre radius of the application area (GIS Database). Two conservation significant flora species have been located within the application area (Ecoscape, 2024).</td></tr>
<tr><td>Ecological communities</td><td>
The biological survey did not record any threatened ecological communities (TECs) or priority ecological communities (PECs) within the application area (Ecoscape, 2024).
One TEC occurs in the Murchison bioregion, being the Depot Springs stygofauna community (DBCA, 2023a).
There is one PEC recorded within a 50 kilometre radius of the application area (GIS Database). This is the Melita calcrete groundwater assemblage type on Raeside palaeodrainage on Melita (Sons of Gwalia) Station, Priority 1 PEC (GIS Database). This PEC is located approximately 40.5 kilometres from the application area.
</td></tr>
<tr><td>Fauna</td><td>The desktop assessment located 11 conservation significant fauna species recorded within a 50 kilometre radius of the application area (GIS Database). One conservation significant fauna species has been located within the application area (GIS Database).</td></tr>
</table>

Characteristic	Details
Fauna habitat	A fauna habitat field assessment was conducted between 27 March and 7 April 2023 and 18 to 22 September 2023 by Ecoscape (2024). Seven broad habitat types were identified: • Mulga woodland (527.3 hectares – 523.4 hectares within revised application area); • Chenopod shrubland (116.9 hectares – 84.9 hectares within revised application area); • Mixed shrubland (96.2 hectares); • Rocky escarpment (64.3 hectares – 49.0 hectares within revised application area); • Flood plain (7.1 hectares – zero hectares within revised application area); • Drainage line (2.6 hectares); and • Mineshaft/cave (too small to be mapped) (Ecoscape, 2024).

B.2. Vegetation extent

	Pre-European area (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current extent in all DBCA Managed Land (proportion of pre-European extent) (%)
IBRA Bioregion - Murchison	28,120,587	28,044,823	~99	293,505	1.04
Beard vegetation associations - State					
389	642,357	640,469	~99	22,955	3.57
18	19,892,306	19,843,148	~99	1,317,179	6.62
125	3,485,785	3,146,487	~90	265,740	7.62
Beard vegetation associations - Bioregion (Murchison)					
389	493,978	492,089	~99	22,955	4.65
18	12,403,172	12,363,253	~99	45,094	0.36
125	711,484	710,255	~99	51,223	7.20

Government of Western Australia (2019)

B.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix H.1), and biological survey information, impacts to the following conservation significant flora required further consideration (Ecoscape, 2024).

The likelihood of occurrence for these species were determined by potentially suitable habitat within the application area and known regional records (Ecoscape, 2024; Talis Consultants, 2024; Western Australian Herbarium, 1998-; GIS Database).

Species name	Conservation status	Suitable habitat? [Y/N]	Distance of closest record to application area (km)	Are surveys adequate to identify? [Y, N, N/A]	Likelihood of occurrence
Hemigenia exilis	P4	Y	0	Y	Known to occur – discussed in Section 3.2.1
Tecticornia globulifera	P1	Y	0	Y	Known to occur – discussed in Section 3.2.1
Angianthus prostratus	P3	Y	<7	N	Potential – discussed in Section 3.2.1
Nicotiana salina	P1	Y	<22	N	Potential – discussed in Section 3.2.1
Acacia sp. Marshall Pool (G. Cockerton 3024)	P3	Y	<22	Y	Unlikely
Calandrinia quartzitica	P1	Y	<18	Y	Unlikely
Calandrinia sp. Menzies (F. Hort et al. FH 4100)	P3	Y	<28	Y	Unlikely
Eremophila eversa	P1	Y	<28	Y	Unlikely
Micromyrtus serrulata	P3	N	<35	Y	Unlikely

Species name	Conservation status	Suitable habitat? [Y/N]	Distance of closest record to application area (km)	Are surveys adequate to identify? [Y, N, N/A]	Likelihood of occurrence
Pigea sp. *Chloroxantha* (E. Bennett & D. Bright EUC 1810)	P3	Y	<15	Y	Unlikely
Placynthium nigrum	P3	N	<42	N	Unlikely
Ptilotus chortophytus	P1	Y	<35	Y	Unlikely
Ptilotus sp. Kookynie (J. Jackson & B. Moyle 261)	P1	N	<34	Y	Unlikely
Ptilotus tetrandrus	P1	Y	<8	Y	Unlikely
Tecticornia mellarium	P1	Y	<43		Unlikely
Triglochin protuberans	P3	Y	<24	Y	Unlikely
Acacia websteri	P1	Y	<43	Y	Very unlikely
Anacampseros sp. Eremaean (F. Hort, J. Hort & J. Shanks 3248)	P1	N	<34	Y	Very unlikely
Calytrix hislopii	P3	Y	<29	Y	Very unlikely
Calytrix praecipua	P3	N	<24	Y	Very unlikely
Conospermum toddii	P4	N	<17	Y	Very unlikely
Cratystylis centralis	P3	Y	<34	Y	Very unlikely
Eremophila mirabilis	P2	N	<30	Y	Very unlikely
Eremophila sp. Lake Carey (E. Mattiske LM 197)	P1	Y	<50	Y	Very unlikely
Eremophila veronica	P3	N	<45	Y	Very unlikely
Eucalyptus jutsonii subsp. *jutsonii*	P4	N	<47	Y	Very unlikely
Thryptomene eremaea	P2	Y	<34	Y	Very unlikely

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

B.4. Fauna analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix H.1), and biological survey information, impacts to the following conservation significant fauna required further consideration (Ecoscape, 2024; Specialised Zoological, 2023).

The likelihood of occurrence for these species were determined by potentially suitable habitat within the application area and known regional records (BirdLife Australia, 2025b; Commonwealth of Australia, 2008; DAWE, 2008; DCCEEW, 2023; DEC, n.d.; DEPW, 2021; Ecoscape, 2024; NSW TSSC, 2020; NWF, n.d.; Specialised Zoological, 2023; Timms, 2008; 2009; WAM, 2025; GIS Database).

Species name	Conservation status		Suitable habitat? [Y/N]	Distance of closest record to application area (km)	Are surveys adequate to identify? [Y, N, N/A]	Likelihood of occurrence
	WA	EPBC				
Black-eared cuckoo (*Chalcites osculans*)	MA	MA	Y	0.0	Y	Known to occur – discussed in Section 3.2.3
Peregrine Falcon (*Falco peregrinus*)	-	OS	Y	19.8	Y	Likely – discussed in Section 3.2.3
Malleefowl (*Leipoa ocellata*)	VU	VU	Y	10.0	Y	Potential – discussed in Section 3.2.3
Long-tailed dunnart (*Sminthopsis longicaudata*)	-	P4	Y	25.2	Y	Potential – discussed in Section 3.2.3
Common sandpiper (*Actitis hypoleucos*)	MI	MI	Y	34.0	Y	Potential – discussed in Section 3.2.3
Common greenshank (*Tringa nebularia*)	MI	MI	Y	35.1	Y	Potential – discussed in Section 3.2.3
Pacific golden plover (*Pluvialis fulva*)	MI	MI	Y	35.1	Y	Potential – discussed in Section 3.2.3

Species name	Conservation status		Suitable habitat? [Y/N]	Distance of closest record to application area (km)	Are surveys adequate to identify? [Y, N, N/A]	Likelihood of occurrence
	WA	EPBC				
Sharp-tailed sandpiper (*Calidris acuminata*)	MI	MI	Y	35.1	Y	Potential – discussed in Section 3.2.3
Hooded plover (*Charadrius cucullatus*)	-	P4	Y	37.0	Y	Potential – discussed in Section 3.2.3
Fairy shrimp (*Branchinella simplex*)	-	P1	Y	42.4	N	Potential – discussed in Section 3.2.3
Southern whiteface (*Aphelocephala leucopsis*)	VU	P4	Y	232.5	Y	Potential – discussed in Section 3.2.3
Greater stick-nest rat (*Leporillus conditor*)	VU	CD	Y	31.9	Y	Unlikely – discussed in Section 3.2.3
Princess parrot (*Polytelis alexandrae*)	VU	VU	N	178.7	Y	Unlikely
Wood sandpiper (*Tringa glareola*)	MI	MI	N	43.9	Y	Unlikely
Central long-eared bat (*Nyctophilus major tor*)	-	P3	Y	109.3	Y	Unlikely

CR: critically endangered, EN: endangered, VU: vulnerable, P: priority, MI: migratory, CD: conservation dependent, OS: other specially protected, MA: Marine

Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The flora and vegetation survey provided with the application identified priority flora within the application area (Ecoscape, 2024). The subterranean fauna survey identified species that have only been located within the application area (Bennelongia, 2023b). The area proposed to be cleared also contains potential habitat for other priority flora species and habitat for conservation significant fauna.	At variance	Yes *Refer to Section 3.2.1, Section 3.2.2 and Section 3.2.3, above.*
Principle (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."* Assessment: The area proposed to be cleared potentially contains significant habitat for conservation significant fauna.	At variance	Yes *Refer to Section 3.2.2 and Section 3.2.3, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: No Threatened flora species were recorded in the flora and vegetation survey of the application area and a desktop search within a 50 kilometre radius of the application area did not identify any Threatened flora species (Ecoscape, 2024; GIS Database). Therefore, the area proposed to be cleared is unlikely to be necessary for the continued existence of Threatened flora.	Not likely to be at variance	No
Principle (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."* Assessment: There are no mapped Threatened Ecological Communities (TECs) within the application area (GIS Database). No TECs were recorded during biological surveys of the site (Ecoscape, 2024). The application area is unlikely to support TECs known to	Not likely to be at variance	Yes *Refer to Section 3.2.2, above.*

Assessment against the clearing principles	Variance level	Is further consideration required?
the Pilbara or Gascoyne bioregions (Bennelongia, 2023b; Cooper et al., 2002; DBCA, 2023a; 2023b).		
Environmental value: significant remnant vegetation and conservation areas		
Principle (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."* Assessment: The local area has not been extensively cleared (GIS Database). The extent of the native vegetation in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia (Commonwealth of Australia, 2001; Appendix B.2).	Not at variance	No
Principle (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."* Assessment: The application area is not located within any DBCA legislated conservation areas (GIS Database). The nearest legislated conservation area is an unnamed nature reserve approximately 32.5 kilometres southwest of the application area (GIS Database). Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.	Not likely to be at variance	No
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: Given multiple major and minor non-perennial watercourses intercept the application area, the proposed clearing is likely to impact surface water flows and riparian vegetation, despite the exclusion of the salt lake and floodplain habitats from the permit clearing footprint (GIS Database; Section 3.1). Condition: To address the above impact, the following management measures will be required as a condition on the clearing permit: • where practicable, avoid clearing riparian vegetation.	At variance	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: Soils mapped within the application area are susceptible to wind and water erosion, and disruption of natural surface water flows may result in vegetation death due to water starvation (DPIRD, 2025; Pringle, 1994; GIS Database). Therefore, the proposed clearing may result in appreciable land degradation. Conditions: To address the above impact, the following management measures will be required as a condition on the clearing permit: • a watercourse management condition requiring that surface water flows are not impacted by the proposed clearing; and • a staged clearing condition to minimise risk of erosion.	May be at variance	No
Principle (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."* Assessment: The proposed clearing could impact groundwater quality through the clearing of groundwater dependent vegetation. Groundwater dependent vegetation within the application area is associated with a watercourse and can be managed by avoiding riparian vegetation.	May be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Given multiple major and minor non-perennial watercourses intercept the application area, the proposed clearing is likely to impact surface water flows, which could impact surface water quality (GIS Database). Conditions: To address the above impact, the following management measures will be required as a condition on the clearing permit: • a watercourse management condition requiring that surface water flows are not impacted by the proposed clearing; and • where practicable, avoid clearing riparian vegetation.		
Principle (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."* Assessment: The application area has an arid climate with dependable rainfall in the months of June and July, and less dependable rainfall greater volumes in the months January to March (CALM, 2002; Carrick Consulting, 2024). There are no permanent watercourses or waterbodies within the application area (GIS Database). The Lake Raeside salt lake system, which intercepts the application area, may flood in heavy rainfall events associated with cyclones or tropical low pressure systems (Carrick Consulting, 2024; GIS Database). The proposed clearing is unlikely to increase the incidence or intensity of natural flooding events.	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. Vegetation types

Table adapted from Ecoscape (2024).

Landform	Vegetation unit	Vegetation type	Floristic quadrats and representative photograph	Other characteristic species
Low dunes	**AaEmRd**	*Acacia aneura, A. incurvaneura* and *A. caesaneura* low woodland over *Eremophila miniata,*	AH23009, AH23010, **AH23011,** AH23014, AH23030, AH23125, AH23158	*Aristida contorta, Calandrinia polyandra, Cratystylis subspinescens, Enchylaena tomentosa,*

		Hakea preissii and *Scaevola spinescens* mid sparse shrubland over *Rhagodia drummondii* and *Maireana pyramidata* low sparse chenopod shrubland.		*Gunniopsis quadrifida, Leichhardtia australis, Maireana triptera, Ptilotus obovatus, Senna artemisioides* subsp. *filifolia*
Rocky hills	**AaAePo**	*Acacia aneura* and *A. pteraneura* low open woodland over *A. effusifolia, A. tetragonophylla* and *A. ramulosa* var. *ramulosa* mid sparse shrubland over *Ptilotus obovatus* and *Sclerolaena obliquicuspis* low sparse shrubland/chenopod shrubland	AH23003, **AH23004,** AH23005, AH23006, AH23007, AH23008, AH23015, AH23016 	*Cheilanthes brownii, Enchylaena tomentosa, Enneapogon caerulescens, Eremophila forrestii* subsp. *forrestii, Hakea preissii, Maireana sedifolia, Maireana triptera, Salsola australis, Scaevola spinescens, Senna* sp. Meekatharra (E. Bailey 1-26), *Solanum lasiophyllum*
Flats/ plains	**AcEfPo**	*Acacia caesaneura, A. incurvaneura* and *A. aneura* low woodland over *Eremophila forrestii* subsp. *forrestii* and *A. tetragonophylla* mid sparse shrubland over *Ptilotus obovatus, Teucrium teucriiflorum* and *Eragrostis eriopoda* low sparse shrubland/tussock grassland	AH23022, **AH23023,** AH23024, AH23088, AH23129, AH23169, AH23170, AH23172 	*Acacia ramulosa* var. *ramulosa, Leichhardtia australis, Monachather paradoxus, Rhagodia drummondii, Santalum lanceolatum, Scaevola spinescens, Senna glutinosa* subsp. *chatelainiana*
Flats/ plains	**AdMsMt**	*Acacia duriuscula* low open woodland over *Maireana sedifolia, Senna artemisioides* subsp. *filifolia* and *Scaevola spinescens* mid sparse shrubland over *Maireana triptera, Ptilotus obovatus* and *Roepera ovata* low sparse chenopod shrubland/forbland	AH23159, AH23160, **AH23161** 	*Acacia tetragonophylla, Acacia victoriae* subsp. *victoriae, Leichhardtia australis, Senna* sp. Meekatharra (E. Bailey 1-26)
Flats/ plains	**AkLs**	*Acacia kalgoorliensis* mid-sparse shrubland over *Lawrencia squamata*, *Scaevola spinescens* and *Maireana triptera* low sparse shrubland	AH23162, AH23163, **AH23164** 	*Cratystylis subspinescens, Eremophila miniata, Eremophila oppositifolia* subsp. *angustifolia, Eremophila scoparia, Frankenia setosa, Gunniopsis quadrifida, Maireana carnosa, Maireana glomerifolia, Rhagodia drummondii, Sclerolaena eriacantha*
Flats/ plains	**AlAb**	*Acacia ligulata* and *A. victoriae* subsp. *victoriae* tall open	**AH23165**	*Acacia burkittii, Acacia duriuscula, Acacia tetragonophylla,*

		shrubland over *Atriplex bunburyana* and *Scaevola spinescens* low sparse chenopod shrubland/shrubland		*Austrostipa elegantissima, Leichhardtia australis, Maireana ?tomentosa, Maireana pentatropis, Pittosporum angustifolium, Rhagodia drummondii, Roepera ovata, Senna artemisioides* subsp. *filifolia, Senna flexuosa, Solanum lasiophyllum*
Flats/ plains	**AmFs**	*Acacia masliniana* and *Cratystylis subspinescens* mid-sparse shrubland over *Frankenia setosa* and *Lawrencia squamata* low sparse shrubland	AH23012, AH23018, **AH23021,** AH23126 	*Enchylaena tomentosa, Eremophila miniata, Hakea preissii, Maireana platycarpa, Maireana pyramidata, Maireana triptera, Scaevola spinescens, Senna* sp. Meekatharra (E. Bailey 1-26)
Flats/ plains	**CsLs**	*Cratystylis subspinescens* and *Eremophila miniata* mid-sparse shrubland over *Lawrencia squamata* and *Frankenia setosa* low open shrubland	**AH23019,** AH23020**,** AH23128**,** AH23171 	*Hakea preissii, Maireana platycarpa, Scaevola spinescens, Sclerolaena cuneata, Senna* sp. Meekatharra (E. Bailey 1-26)
Drainage lines	**EcAbPd**	*Eucalyptus camaldulensis* subsp. *arida* mid woodland over *Acacia burkittii* tall sparse shrubland over *Pluchea dentex* low sparse forbland	**AH23157** 	*Aristida contorta, Dodonaea rigida, Duperreya sericea, Grevillea extorris, Leichhardtia australis, Scaevola spinescens, Senna artemisioides* subsp. x *artemisioides*
Flats/ plains	**Mp**	*Maireana pyramidata* and *Lawrencia squamata* low open chenopod shrubland/shrubland	**AH23166,** AH23167**,** AH23168 	*Atriplex bunburyana, Atriplex codonocarpa, Cratystylis subspinescens, Frankenia interioris, Frankenia laxiflora, Gunniopsis quadrifida, Maireana carnosa, Maireana tomentosa, Sclerolaena cuneata*
Flats/ plains	**PaHpCs**	*Pittosporum angustifolium* low sparse woodland over *Hakea preissii* and *Acacia tetragonophylla*	**AH23076**	*Enchylaena tomentosa, Eremophila glabra* subsp. *glabra, Frankenia setosa, Ptilotus divaricatus, Scaevola spinescens,*

		tall open shrubland over *Cratystylis subspinescens* low sparse shrubland.		*Sclerolaena cuneata, Sporobolus ramigerus*
Wetlands	**Tspp**	*Tecticornia* spp. low samphire shrubland	AH23001, AH23002, AH23013, AH23017, AH23025, **AH23026,** AH23027, AH23028, AH23029, AH23031, AH23127 	*Cratystylis subspinescens, Disphyma crassifolium, Frankenia cinerea, Frankenia laxiflora, Maireana amoena, Maireana pyramidata, Sclerolaena cuneata, Tecticornia indica* subsp. *bidens, Tecticornia* sp. 1, *Tecticornia* sp. 3, *Tecticornia* sp. 8, *Tecticornia* sp. Burnerbinmah (D. Edinger et al. 101), *Tecticornia* sp. Dennys Crossing (K.A. Shepherd & J. English KS 552)

Appendix F. Map of *Hemigenia exilis* locations

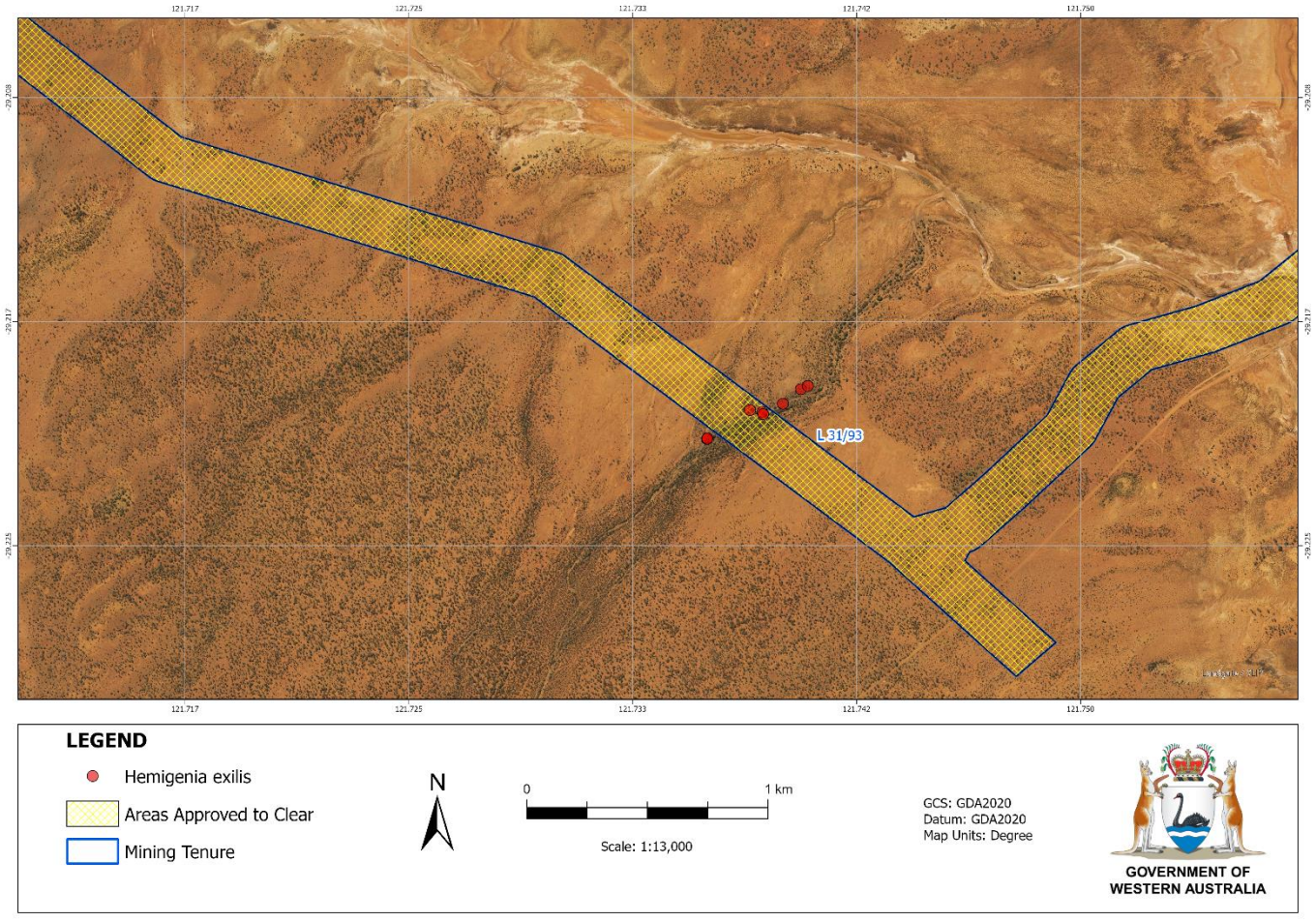

Figure 7. Map showing *Hemigenia exilis* locations recorded from Ecoscape (2024) survey.

Appendix G. Maps of *Tecticornia globulifera* locations

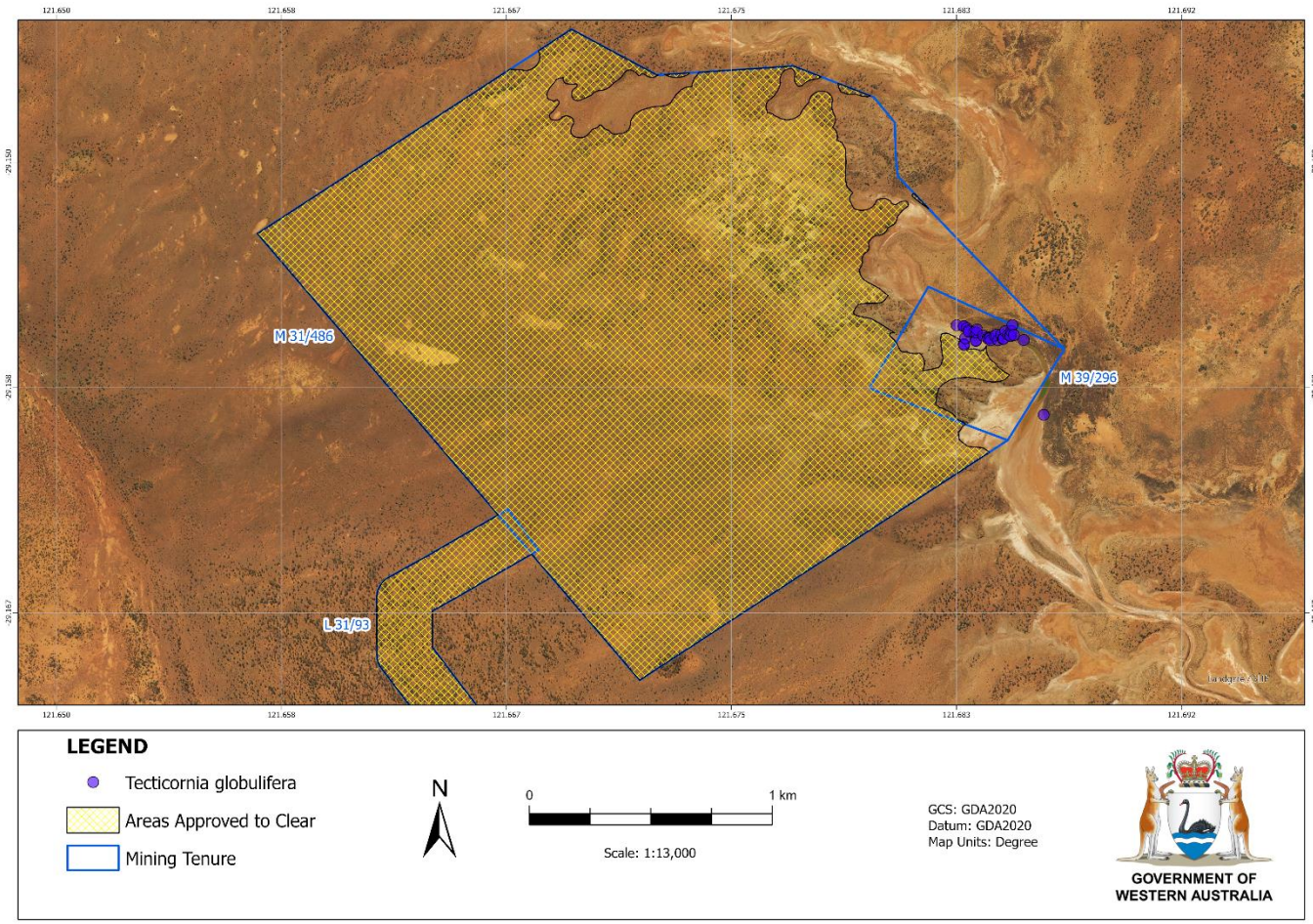

Figure 8. Map showing *Tecticornia globulifera* locations recorded from Ecoscape (2024) survey.

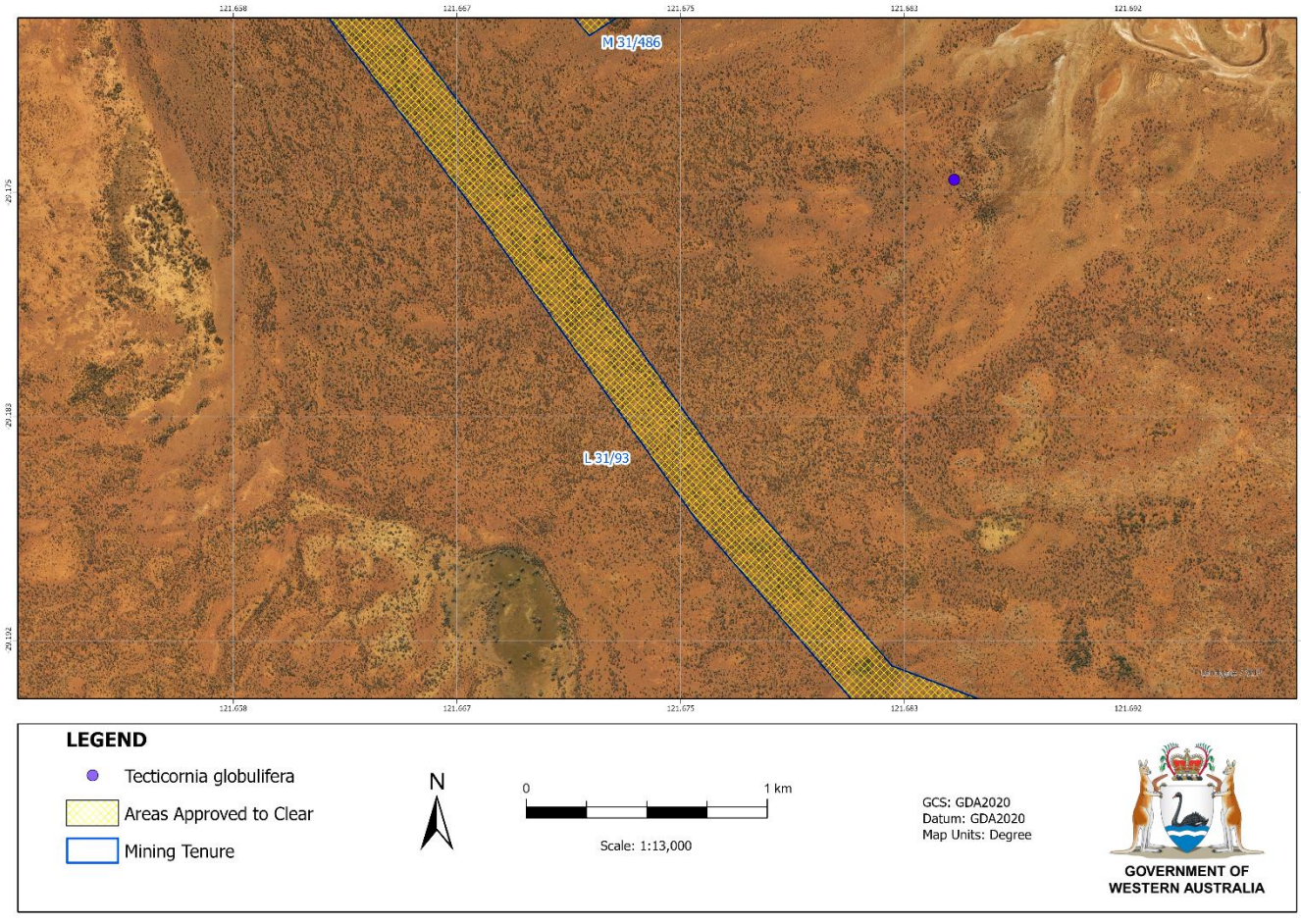

Figure 9. Map showing *Tecticornia globulifera* locations recorded from Ecoscape (2024) survey.

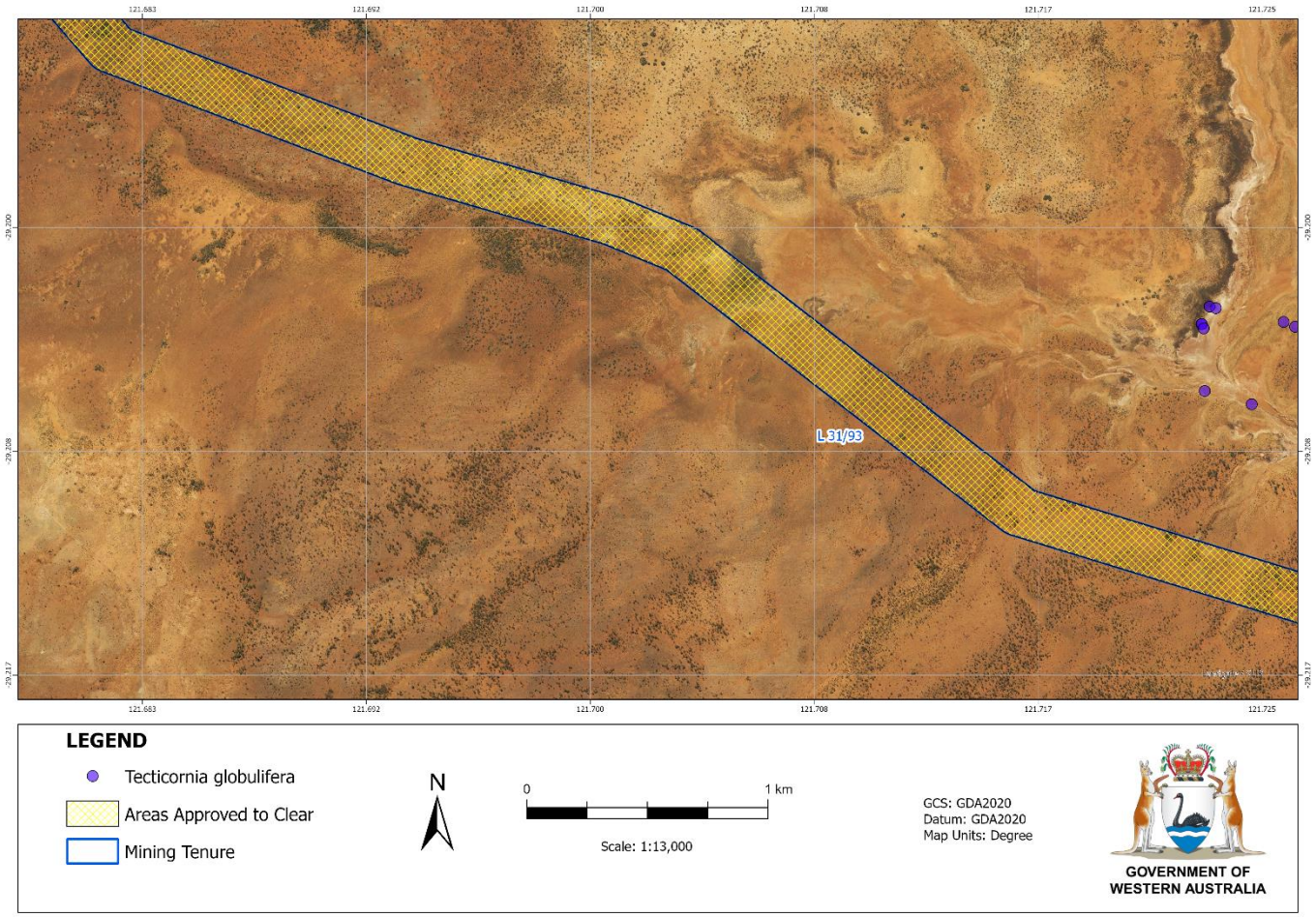

Figure 10. Map showing *Tecticornia globulifera* locations recorded from Ecoscape (2024) survey.

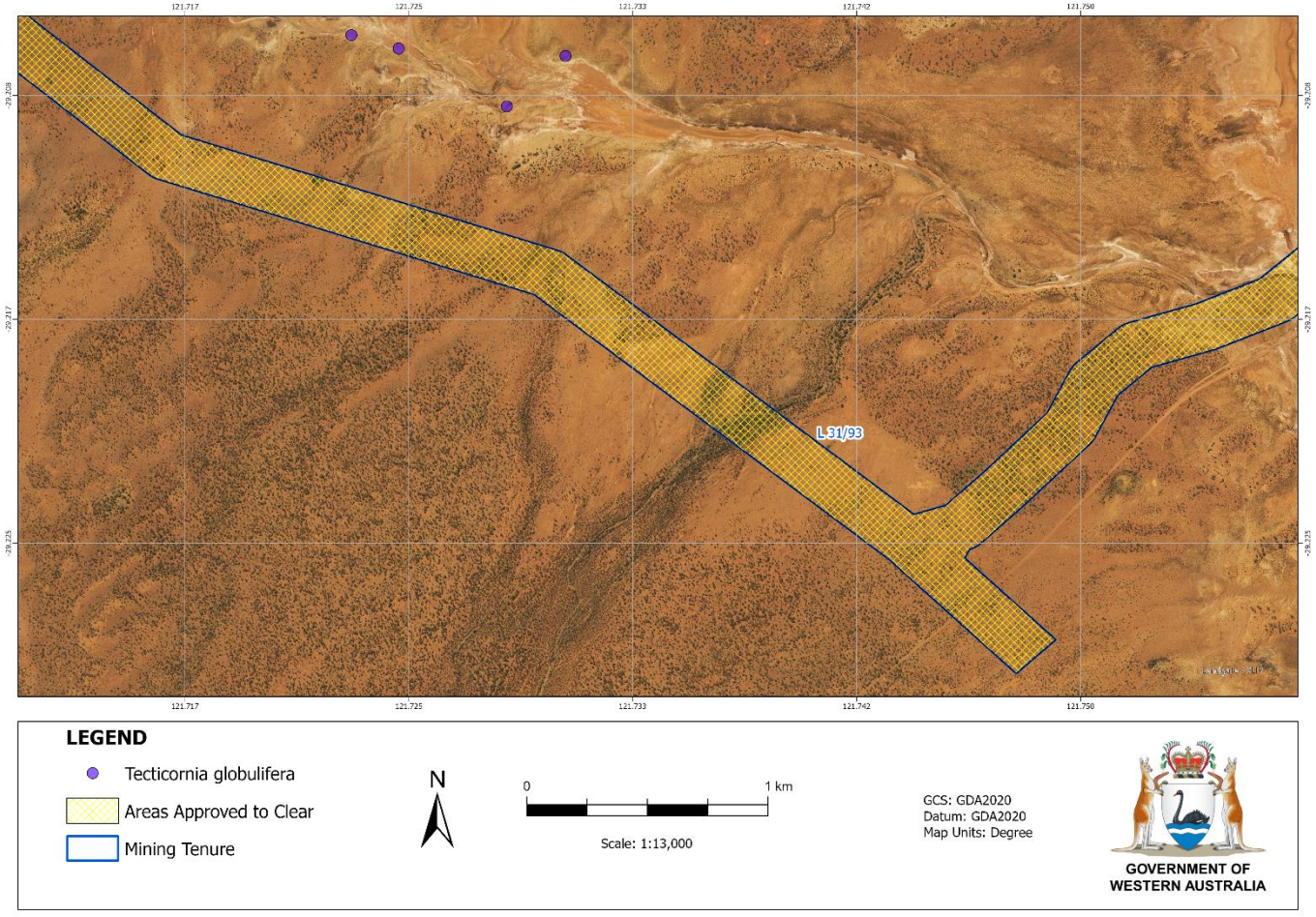

Figure 11. Map showing *Tecticornia globulifera* locations recorded from Ecoscape (2024) survey.

Appendix H. Sources of information

H.1. GIS datasets

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Clearing Regulations - Environmentally Sensitive Areas (DWER-046)
- Clearing Regulations - Schedule One Areas (DWER-057)
- DBCA - Lands of Interest (DBCA-012)
- DBCA - Legislated Lands and Waters (DBCA-011)
- DBCA Fire History (DBCA-060)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Esri World Imagery
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Native Title (ILUA) (LGATE-067)
- Native Vegetation Extent (DPIRD-005)
- Pre-European Vegetation (DPIRD-006)
- Ramsar Sites (DBCA-010)
- 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 and Priority Flora (TPFL)
- Threatened and Priority Flora (WAHerb)
- Threatened and Priority Fauna
- Threatened and Priority Ecological Communities
- Threatened and Priority Ecological Communities (Buffers)

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4. Glossary

Acronyms:

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

Definitions:

DBCA (2023) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia:

Threatened species

T 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

Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.

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

SP **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.

Priority species

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.