

1. Application details and outcomes

1.1. Permit application details

| | |
|-----------------------|---|
| Permit number: | 10246/1 |
| Permit type: | Purpose Permit |
| Applicant name: | Iluka Rare Earths Pty Ltd |
| Application received: | 14 July 2023 |
| Application area: | 3.3 hectares |
| Purpose of clearing: | Construction and expansion of haulage roads |
| Method of clearing: | Mechanical Removal |
| Tenure: | <i>Mineral Sands (Eneabba) Agreement Act 1975</i> , Mineral Lease 267SA (AML 70/267) Mining Lease 70/821 |
| Location (LGA area): | Shire of Carnamah |
| Colloquial name: | Eneabba Mine Access Road |

1.2. Description of clearing activities

Iluka Rare Earths Pty Ltd proposes to clear up to 3.3 hectares of native vegetation within a boundary of approximately 7.3 hectares, for the purpose of mining related infrastructure (Iluka 2024). The project is located approximately 3.5 kilometres south of Eneabba, within the Shire of Carnamah (GIS Database).

The application is to allow for the extension of existing Eneabba Mine Access Road to link to an adjacent haul road and allow safe access when turning from Brand Highway into the Mine Access Road (Iluka, 2023).

1.3. Decision on application and key considerations

| | |
|----------------|-----------------------------------|
| Decision: | Grant |
| Decision date: | 1 October 2024 |
| Decision area: | 3.3 hectares of native vegetation |

1.4. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) on 14 July 2023. 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 G), supporting information provided by the applicant (Appendix A) 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).

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 will result in the following significant residual impacts (SRI):

- The loss of three hectares of native vegetation that provides significant foraging habitat for Carnaby's cockatoo (*Zanda latirostris*).

To address the above SRI and applying the WA environmental offsets metric (offset calculator and guidelines), the Delegated Officer determined that the following revegetation offset is required (Section 4):

- The revegetating of 5.27 hectares of agricultural land with native plant species known to provide foraging for black cockatoos and the placement of a conservation covenant over the vegetation.

The above offset will address 100 percent of the SRI of the proposed clearing.

The assessment also identified that the proposed clearing may result in:

- the potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values;

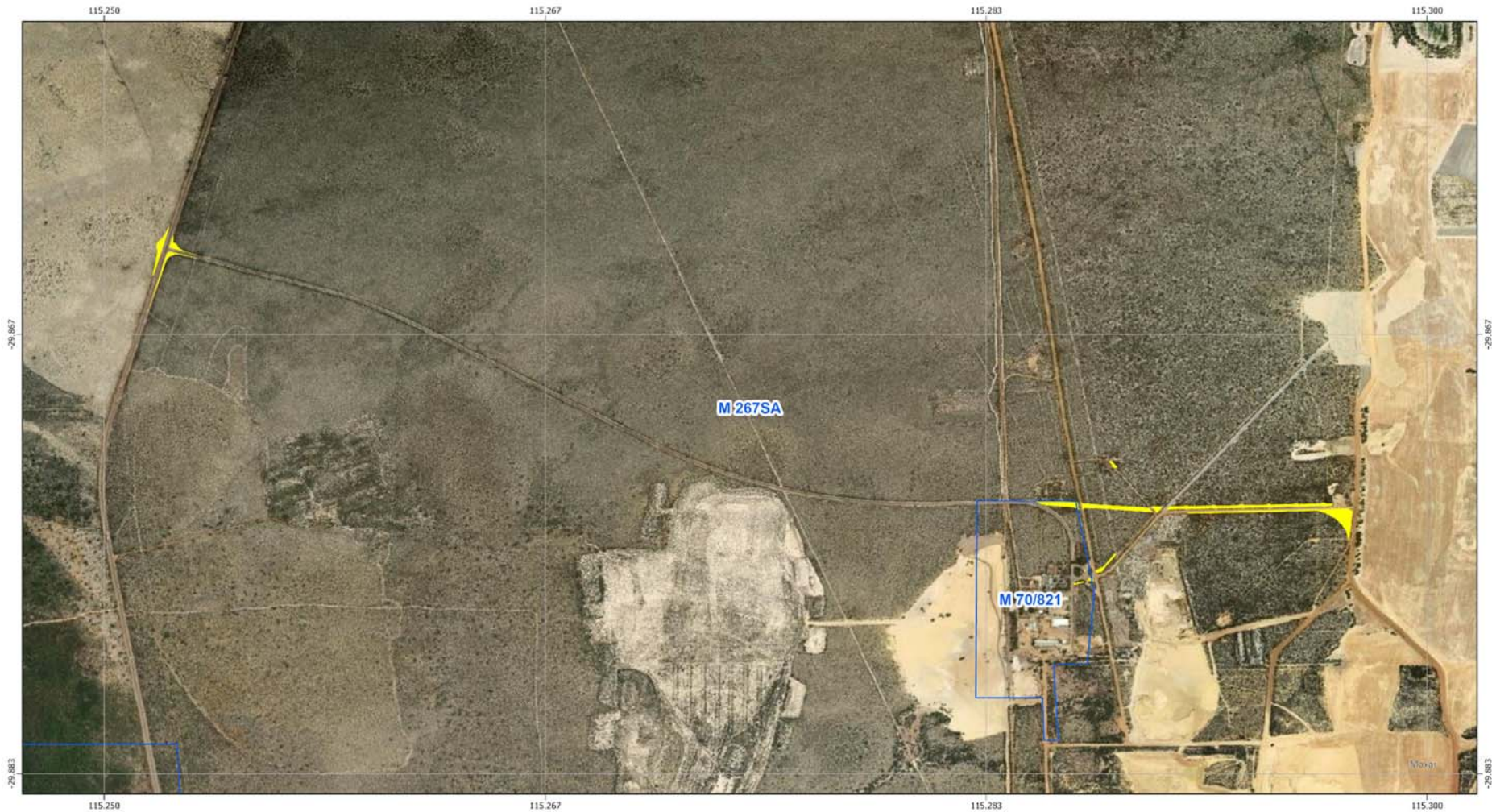
- impacts to conservation significant flora;
- impacts to conservation significant fauna; and
- potential land degradation in the form of wind erosion.

The Delegated Officer decided to grant a clearing permit subject to the following conditions, which have been imposed on the clearing permit, to manage and address the impacts and extent of clearing:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback;
- staged clearing to minimise wind erosion;
- undertake slow, progressive one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity; and
- provide an offset area of 5.27 hectares which will be revegetated with native plant species known to provide habitat for Carnaby's cockatoo and have a Conservation Covenant placed over it.

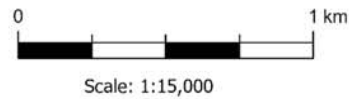
1.5. Site map

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



LEGEND

-  Mining Tenure
-  CPS 10246/1



GCS: GDA2020
 Datum: GDA2020
 Map Units: Degree



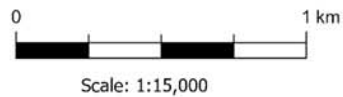
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Figure 1. Map of the application area. The yellow area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.



LEGEND

- Mining Tenure
- Cadastre
- Areas subject to Conditions 10 and 11



GCS: GDA2020
 Datum: GDA2020
 Map Units: Degree



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Figure 2. Map of the offset boundary of the area subject to Conditions.

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)*
- *Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act)*
- *Land Administration Act 1997 (WA)*
- *Mining Act 1978 (WA)*
- *Mineral Sands (Eneabba) Agreement Act 1975*

Relevant policies considered during the assessment include:

- *Environmental Offsets Policy (2011)*

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)*
- *Environmental Offsets Guidelines (August 2014)*
- *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.

Evidence was submitted by the applicant, demonstrating that various avoidance and mitigation measures such as the following will be implemented:

- the original clearing application was for 7.1 hectares of native vegetation, this was reduced to 3.3 hectares;
- modifying (narrowing) the design of the mine access road extension to reduce clearing of Carnaby's cockatoo habitat;
- relocating infrastructure (gate house and weighbridge) to existing cleared areas;
- avoiding vegetation on the north side of the existing haul road for linear infrastructure (power line and water pipeline);
- avoidance of the construction of slip lanes for turning vehicles at the Brand Highway intersection, avoiding an additional 6.0 hectares of clearing (over and above the 7.1 hectares); and
- earthmoving machinery and other vehicles will be required to remain within disturbed areas and existing tracks to prevent impacts to surrounding habitat;
- vehicles and machinery will be required to be free of weed and seed material prior to mobilisation to site to protect the surrounding vegetation.

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.

After consideration of avoidance and mitigation measures, it was determined that an offset to counterbalance the significant residual impacts to Carnaby's cockatoo foraging habitat was necessary. In accordance with the Government of Western Australia's Environmental Offsets Policy and Environmental Offsets Guidelines, these significant residual impacts have been addressed through the conditioning of environmental offset requirements on the permit. The nature and suitability of the offset is provided are summarised in Section 4.

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 and 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 and vegetation) - Clearing Principles (a)

Assessment

Umwelt (2023) undertook a reconnaissance and targeted flora and vegetation assessment of the application area and surrounding areas (129.1 hectares) in September and November of 2022. Nine Priority flora were identified within the application area, the below states the total number of individuals recorded within the application area during the flora surveys, with a calculated maximum impact to the total individuals recorded within the survey area (Umwelt, 2023).

| Species | Total individuals recorded within application area | Total individuals recorded within survey area | Maximum impact to species if all individuals were cleared (%) |
|---|--|---|---|
| <i>Calytrix superba</i> | 7 | 3,246 | 0.2 |
| <i>Desmocladius elongatus</i> | 3 | 227 | 1.3 |
| <i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i> | 6 | 178 | 3.4 |
| <i>Haemodorum loratum</i> | 7 | 287 | 2.4 |
| <i>Hemiandra</i> sp. Eneabba (H. Demarz 3687) | 16 | 511 | 3.1 |
| <i>Schoenus griffinianus</i> | 3 | 205 | 1.5 |
| <i>Verticordia argentea</i> | 4 | 1,147 | 0.3 |
| <i>Verticordia aurea</i> | 4 | 3,766 | 0.1 |
| <i>Verticordia fragrans</i> | 13 | 2,594 | 0.5 |

Based on the above percentages, the maximum impact to the recorded species would be below 4%. There is a potential that individuals of these species will be lost through the proposed clearing, however, the overall impact is relatively low at a regional and local scale and unlikely to alter the conservation status of any of them.

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on conservation significant flora can be managed by avoiding and minimising disturbance and by taking steps to minimise the risk of the introduction and spread of weeds.

Conditions

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

- Avoid, minimise to reduce the impacts and extent of clearing; and
- Take hygiene steps to minimise the risk of the introduction and spread of weeds.

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

Assessment

Six conservation significant fauna species are considered to potentially occur within the application area (Western Wildlife, 2023; GIS Database). The fauna field survey, undertaken by Western Wildlife in September of 2022, identified one conservation significant species, *Zanda latirostris* (Carnaby's cockatoo) (Vulnerable), foraging within the application area (Western Wildlife, 2023).

The Carnaby's cockatoo, *Zanda latirostris* (Endangered) are a large cockatoo that is endemic to, and widespread in the south-west of Western Australia (DCCEEW, 2023). This species occurs in native eucalypt woodlands (e.g. those that contain salmon gum and wandoo, and in shrubland or kwongan heathland dominated by hakea, dryandra, banksia and grevillea species) (DCCEEW, 2023). The application area is located within the modelled distribution of Carnaby's cockatoo and this species has been recorded within the application area (DCCEEW, 2023; Western Wildlife, 2023). Western Wildlife carried out a targeted survey for Carnaby's cockatoo habitat in September 2022 (Western Wildlife, 2023). Three habitats were identified in the application area: Kwongan heath (uplands), Kwongan heath (lowlands) and rehabilitation (shrublands and heaths) (Western Wildlife, 2023). The Carnaby's Cockatoo Recovery Plan states that there are multiple reasons for the decline of Carnaby's cockatoo, however the decline to date has primarily been through the extensive clearing of nesting and feeding habitat (DPaW, 2013). Ongoing counts of Carnaby's cockatoo numbers on the Perth-Peel Coastal Plain estimate that there has been a 35 per cent reduction in their population from 2010-2019 (Peck, Barrett and Williams, 2019). The long-term survival of Carnaby's cockatoos depends on the availability of suitable breeding habitat and hollows, as well as foraging habitat capable of providing enough food to sustain the population (DPaW, 2013).

The species was recorded foraging within the survey area, however Western Wildlife did not identify any evidence of potential breeding habitat or evidence of roosting in the adjacent planted eucalypts (Western Wildlife, 2023). The closest recorded roost is located approximately five kilometres north of the application area (GIS Database). The application area was found to provide high quality foraging habitat for this species (Western Wildlife, 2023). Surveys have also identified that birds recorded at Eneabba are seasonally vagrant, most likely from east to north-east (Carnamah – Three Springs region) where there are good stands of

tall eucalypts for breeding (Johnstone, 2013). However, the application area is still an important food source given the land clearing which has occurred in the area. Important food in the Eneabba region for this species such as *Banksia* spp. and *Hakea* spp. have been recorded within the application area (Western Wildlife, 2023). Given the increasing cumulative clearing impacts in the local area, the proposed clearing of high quality foraging habitat within five kilometres of a roost site is likely to have a significant residual impact for this species.

Five additional conservation significant fauna species have been previously recorded within 20 kilometres of the application area, however, they were not recorded during the targeted fauna survey (Western Wildlife, 2023). The application area contains suitable habitat for these species which may forage within the area, however, it is not considered significant and similar habitat is available in adjacent areas. Impacts may be managed with a fauna condition (slow directional clearing) to allow for individuals to relocate to the adjacent vegetation.

Conclusion

Based on the above assessment, the proposed clearing will result in the loss of three hectares of significant foraging habitat for Carnaby's cockatoo. Given that all patches of this community are considered to be critical to the survival of this community the proposed clearing is likely to constitute a significant residual impact and require an environmental offset.

Conditions

- Directional clearing, which requires slow, progressive, one directional clearing to allow terrestrial fauna to disperse ahead of the clearing activity should they occur on site at the time of clearing; and
- Offset – revegetation of 5.27 hectares of agricultural land with native plant species known to provide foraging habitat for black cockatoos and placement of a conservation covenant over the area.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 14 July 2023 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 (Yamatji Nation - WAD345/2019) over the area under application (DPLH, 2024). This claim has been determined by the Federal Court on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no registered Aboriginal Sites of Significance within the application area (DPLH, 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.

It is noted that the proposed clearing may impact on Carnaby's cockatoo (*Zanda latirostris*), which are 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 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.

4. Suitability of offsets

Through the detailed assessment outlined in Section 3.2 above, the Delegated Officer has determined that the following significant residual impacts remain after the application of the avoidance and mitigation measures summarised in Section 3.1:

- The loss of three hectares of Carnaby's cockatoo foraging habitat.

To counterbalance the above impacts, the applicant has committed to revegetating an area of 5.27 hectares of agricultural land located within six kilometres of the application area, with native plant species known to provide foraging habitat for Carnaby's cockatoos and placing a conservation covenant over the area to ensure it remains protected. The offset site is directly adjacent to the same tract of native vegetation that the application area is situated within.

In assessing whether the proposed offset is adequate and proportionate to the significance of environmental values being impacted, a calculation using the WA Environmental Offsets Metric was undertaken. The calculation indicates that when combined, the proposed offsets will address 100 percent of the significant residual impacts of clearing and is consistent with the WA Environmental Offsets Policy September 2011. The offset calculations are available in Appendix E.

End

Appendix A. Additional information provided by applicant

| Summary of comments | Consideration of comment |
|--|---|
| <p>DEMIRS review of the proposed clearing and associated supporting information identified that the proposed clearing would result in significant environmental impacts including:</p> <ul style="list-style-type: none"> The loss of three hectares of significant foraging habitat for black cockatoos. | <p>Iluka Resources provided additional information which proposed that the significant residual impacts could be offset by the provision of an offset area to be revegetated and a Conservation Covenant to be placed over the offset area (Iluka, 2024).</p> |

Appendix B. Site characteristics

B.1. Site characteristics

| Characteristic | Details |
|--|--|
| Local context | The project is located approximately 3.5 kilometres south of Eneabba, within the Shire of Carnamah and falls within Geraldton Sandplains Interim Biogeographic Regionalisation for Australia (IBRA) region (GIS Database). The area proposed to be cleared is part of an expansive tract of native vegetation in the intensive land use zone of Western Australia (GIS Database). Approximately 60 percent of native vegetation remains within the local area (GIS Database). It is surrounded by previously disturbed areas from historical mining (GIS Database). |
| Ecological linkage | According to available databases, the application area does not contain any known or mapped ecological linkages (GIS Database). |
| Conservation areas | The application area does not intersect any conservation areas (GIS Database). The nearest conservation area, South Eneabba Nature Reserve (R 31030), is located approximately 1.5 kilometres south from the application area (GIS Database). |
| Vegetation description | <p>The vegetation of the application area is broadly mapped as the following Beard vegetation association:</p> <ul style="list-style-type: none"> 379: shrublands; scrub-heath on lateritic sandplain in the central Geraldton Sandplain Region (GIS Database). <p>A flora and vegetation survey was conducted over the application area by Umwelt during September and November of 2022 (Umwelt, 2023). The following vegetation associations were recorded within the application area (Umwelt, 2023):</p> <ul style="list-style-type: none"> FCT 1a: Open Low Woodland to Open Low Scrub of <i>Eucalyptus pleurocarpa</i> and/or <i>Eucalyptus todtiana</i> over mixed shrubs dominated by <i>Banksia spp.</i> and <i>Hakea spp.</i> over sedges on grey to brown sands with very occasional laterite influence on lower to mid slopes FCT 2a: Low Woodland of <i>Banksia attenuata</i> and occasional <i>Banksia menziesii</i> and <i>Xylomelum angustifolium</i> over Low Scrub of mixed species including <i>Banksia leptophylla var. leptophylla</i>, <i>Banksia candolleana</i>, <i>Melaleuca leuropoma</i> and <i>Hibbertia hypericoides</i> on brown or grey sand on upper slopes; FCT 2b: Scrub of <i>Banksia attenuata</i>, with emergent <i>Eucalyptus todtiana</i> or <i>Eucalyptus pleurocarpa</i>, over Low Scrub dominated by <i>Banksia spp.</i> on predominantly yellow sands on mid and upper slopes; FCT 6b: Shrublands and Heaths, with occasional Low Woodland of <i>Eucalyptus pleurocarpa</i>. Common species include <i>Allocasuarina microstachya</i>, <i>Melaleuca leuropoma</i>, <i>Melaleuca trichophylla</i>, and <i>Verticordia spp.</i> over sedges on grey-brown sands, sandy clays and or gravel on flats, swales and lower slopes. This FCT (Floristic Vegetation Type) was always associated with areas of FCT 2a. |
| Vegetation condition | <p>The vegetation survey indicate the vegetation within the proposed clearing area is in 'Degraded' to 'Excellent' (Keighery, 1994) condition, described as:</p> <ul style="list-style-type: none"> Excellent: Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species; and Degraded: Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing. <p>The full Keighery (1994) condition rating scale is provided in Appendix D.</p> |
| Climate and landform | The proposed area to be cleared is located within the Geraldton Sandplains Interim Biogeographic Regionalisation for Australia (IBRA), within the Lesueur Sandplain subregion (GIS Database). The climate of the region is characterised by an annual rainfall of 489.6 millimetres (BoM, 2024). |
| Soil description and Land degradation risk | <p>The soils of the application area are broadly mapped as the following soil types:</p> <ul style="list-style-type: none"> 221En_2: Eneabba 2 subsystem. Sandplain, with occasional areas of low sandy rises; Sandy and gravelly duplex soils and gravelly deep sands on the plain, minor pale deep sands on the rises; |

| Characteristic | Details |
|------------------------|---|
| | <ul style="list-style-type: none"> 221En_7: Eneabba 7 subsystem. Gently undulating sandplain and low sandy rise; Pale deep sand with a yellow subsoil, yellow deep sands, minor wet soils; 224YeX_MINE: Yerramullah disturbed land, mine phase. Mine. Disturbed land; and 221EnX_MINE: Eneabba disturbed land, mine phase. Mine. Disturbed land; (DPIRD, 2024). <p>The soils within the application area are prone to wind erosion follow removal of native vegetation (Stoneman, 1990).</p> |
| Waterbodies | The desktop assessment and aerial imagery indicated that there are no surface water features within the application area (GIS Database) |
| Hydrogeography | The application area is not mapped within a proclaimed public drinking water area (GIS Database). The area is mapped within the Gascoyne Groundwater Area, proclaimed under the Rights in Water Irrigation (RIWI) Act (GIS Database). |
| Flora | Desktop assessments have identified 100 conservation significant flora species within the surrounding area (10 kilometre radius) (Umwelt, 2023; GIS Database). Nine conservation significant flora species were recorded within the application area (Table B.3) (Umwelt, 2023). |
| Ecological communities | A portion (approximately 0.4 hectares) of the application areas is mapped within the Threatened Ecological Community, 'Ferricrete floristic community (Rocky Springs type)' (Vulnerable) (GIS Database). Flora and vegetation surveys did not observe this TEC within the application area (Umwelt, 2023). |
| Fauna | Six conservation significant fauna species are considered to potentially occur within the application area (Western Wildlife, 2023; GIS Database). The fauna field survey, undertaken by Western Wildlife in September of 2022, identified one conservation significant species, <i>Zanda latirostris</i> (Carnaby's cockatoo) (Vulnerable), foraging within the application area (Western Wildlife, 2023). |
| Fauna habitat | The application area provides high quality foraging habitat to for Vulnerable <i>Zanda latirostris</i> (Carnaby's cockatoo) (Western Wildlife, 2023; GIS Database). |

B.2. Vegetation extent

| | Pre-European area (ha) | Current extent (ha) | Extent Remaining % | Current extent in all DBCA managed land (ha) | Current proportion (%) of pre-European extent in all DBCA Managed Lands |
|---|------------------------|---------------------|--------------------|--|---|
| IBRA Bioregion Geraldton Sandplains | 3,136,037.83 | 1,404,424.32 | 44.78 | 18.24 | 18.12 |
| IBRA Subregion Lesueur Sandplain | 1,171,775.19 | 502,977.44 | 42.92 | 212,497.93 | 18.13 |
| Local Government Shire of Carnamah | 287,231.20 | 118,658.74 | 41.31 | 49,792.85 | 17.34 |
| Beard vegetation associations - State | | | | | |
| Veg Assoc No. 379 | 547,736.94 | 129,736.79 | 23.69 | 28,918.22 | 5.28 |
| Beard vegetation associations - Bioregion | | | | | |
| Veg Assoc No. 379 | 546,507.25 | 129,495.80 | 23.70 | 28,902.86 | 5.29 |
| Beard vegetation associations - Subregion | | | | | |
| Veg Assoc No. 379 | 370,029.76 | 111,632.48 | 30.17 | 21,505.67 | 5.81 |

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 (Umwelt, 2023; Western Wildlife, 2023), impacts to the following conservation significant flora required further consideration.

| Species name | Conservation status | Suitable habitat features? [Y/N] | Distance of closest record to application area (km) | Number of known records (total) |
|---|---------------------|----------------------------------|---|---------------------------------|
| <i>Calytrix superba</i> | P4 | Y | 0 | 37 |
| <i>Desmocladius elongatus</i> | P4 | Y | 0 | 43 |
| <i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i> | P4 | Y | 0 | 58 |
| <i>Haemodorum loratum</i> | P3 | Y | 0 | 25 |
| <i>Hemiandra</i> sp. Eneabba (H. Demarz 3687) | P3 | Y | 0 | 35 |
| <i>Schoenus griffinianus</i> | P4 | Y | 0 | 44 |
| <i>Verticordia argentea</i> | P2 | Y | 0 | 39 |
| <i>Verticordia aurea</i> | P4 | Y | 0 | 31 |
| <i>Verticordia fragrans</i> | P3 | Y | 0 | 30 |

B.4. Fauna analysis table

| Species name | Common Name | Conservation status | Distance of closest record to application area (km) | Suitable habitat features? [Y/N] |
|-------------------------------|--|---------------------|---|----------------------------------|
| <i>Apus pacificus</i> | fork-tailed swift | MI | ~ 17 | Y |
| <i>Calidris ferruginea</i> | curlew sandpiper | CR | ~ 9 | N |
| <i>Calidris ruficollis</i> | red-necked stint | MI | ~ 6 | N |
| <i>Egernia stokesii badia</i> | western spiny-tailed skink | VU | ~ 6 | N |
| <i>Falco peregrinus</i> | peregrine falcon | OS | ~ 26 | Y |
| <i>Idiosoma kwongan</i> | Kwongan heath shield-backed trapdoor spider | P1 | ~ 5 | Y |
| <i>Idiosoma nigrum</i> | shield-backed trapdoor spider | EN | ~ 5 | Y |
| <i>Leipoa ocellata</i> | malleefowl | VU | ~ 5 | N |
| <i>Neelaps calonotos</i> | black-striped snake, black-striped burrowing snake | P3 | ~ 5 | Y |
| <i>Oxyura australis</i> | blue-billed duck | P4 | ~ 9 | N |
| <i>Tringa nebularia</i> | common greenshank | MI | ~ 9 | N |
| <i>Zanda latirostris</i> | Carnaby's cockatoo | EN | 0 | Y |

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority; OS: other specially protected

Appendix C. Assessment against the clearing principles

| Assessment against the clearing principles | Variance level | Is further consideration required? |
|--|----------------|--|
| Environmental value: biological values | | |
| <p><u>Principle (a):</u> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contains conservation significant flora, fauna, habitats, assemblages of plants (Umwelt, 2023; GIS Database).</p> <p>A portion of the application area is mapped as the 'Ferricrete floristic community (Rocky Springs type)' (Vulnerable) Threatened Ecological Community (GIS Database).</p> | At variance | Yes <i>Refer to Section 3.2.1, above.</i> |

| Assessment against the clearing principles | Variance level | Is further consideration required? |
|--|------------------------------|---|
| <p><u>Principle (b):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contains critical foraging habitat for conservation significant fauna notably the Carnaby’s cockatoo (Western Wildlife, 2023; GIS Database).</p> | At variance | <p>Yes</p> <p><i>Refer to Section 3.2.2, above.</i></p> |
| <p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u></p> <p>There are no known records of Threatened flora within the application area (GIS Database). Flora surveys of the application area did not record any species of Threatened flora (Umwelt, 2023; GIS Database).</p> | Not likely to be at variance | No |
| <p><u>Principle (d):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.”</i></p> <p><u>Assessment:</u></p> <p>A portion of the area proposed to be cleared is mapped within the buffer of the Threatened Ecological Community (TEC), ‘Ferricrete floristic community (Rocky Springs type)’ (Vulnerable), however, the flora survey undertaken by Umwelt (2023) did not record any floristic community types considered to be representative of this TEC (GIS Database).</p> | Not likely to be at variance | No |
| Environmental value: significant remnant vegetation and conservation areas | | |
| <p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The extent of the mapped vegetation type is inconsistent with the national objectives and targets for biodiversity conservation in Australia (Commonwealth of Australia, 2001). The one Beard vegetation association located within the application area is vegetation association 379 (shrublands; scrub-heath on lateritic sandplain in the central Geraldton Sandplain Region) (GIS Database). Approximately 23 percent of Beard association 379 remains of its pre-European extent within the State and Bioregion, while 30 percent remains within the IBRA subregion (Government of Western Australia, 2019). However, it is noted that the area proposed to be cleared is part of a large track on native vegetation, with approximately 60 percent of native vegetation remaining within the local area (GIS Database).</p> | At variance | No |
| <p><u>Principle (h):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p> <p><u>Assessment:</u></p> <p>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 (GIS Database).</p> | Not likely to be at variance | No |
| Environmental value: land and water resources | | |
| <p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>There are no watercourses or wetlands within the area proposed to be cleared (GIS Database). None of the vegetation within the application area has been identified as being riparian vegetation (Umwelt, 2023).</p> | Not likely to be at variance | No |
| <p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The application area is mapped within the Eneabba Land System, which may experience wind erosion following removal of native vegetation (Stoneman, 1990). Land degradation may be managed by implementing a staged clearing condition in</p> | May be at variance | No |

| Assessment against the clearing principles | Variance level | Is further consideration required? |
|--|------------------------------|------------------------------------|
| addition to a rehabilitation condition, ensuring cleared areas which are no longer needed to be rehabilitated. | | |
| <p><u>Principle (i):</u> “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</p> <p><u>Assessment:</u></p> <p>Given no water courses / wetlands / Public Drinking Water Sources Areas are recorded within the application area, the proposed clearing is unlikely to impact surface or ground water quality (GIS Database).</p> | Not likely to be at variance | No |
| <p><u>Principle (j):</u> “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</p> <p><u>Assessment:</u></p> <p>The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding (DPIRD, 2024; GIS Database).</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 Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

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

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

Appendix E. Offset calculator value justification

Offset calculator values representing 100% of the significant residual impact.

| Environmental value to be offset | | |
|--|---|---|
| Calculation | Score (Area) | Rationale |
| Conservation significance | | |
| Description | Clearing of Carnaby's Cockatoo Foraging Habitat for Eneabba Mine Access Road | <p>Survey undertaken by Umwelt identified the following vegetation associations containing known cockatoo foraging habitat:</p> <p>FCT 1a: Open Low Woodland to Open Low Scrub of Eucalyptus pleurocarpa and/or Eucalyptus todtiana over mixed shrubs dominated by Banksia spp. and Hakea spp. over sedges on grey to brown sands with very occasional laterite influence on lower to mid slopes</p> <p>FCT 2a: Low Woodland of Banksia attenuata and occasional Banksia menziesii and Xylomelum angustifolium over Low Scrub of mixed species including Banksia leptophylla var. leptophylla, Banksia candolleana, Melaleuca leuropoma and Hibbertia hypericoides on brown or grey sand on upper slopes;</p> <p>FCT 2b: Scrub of Banksia attenuata, with emergent Eucalyptus todtiana or Eucalyptus pleurocarpa, over Low Scrub dominated by Banksia spp. on predominantly yellow sands on mid and upper slopes;</p> <p>FCT 6b: Shrublands and Heaths, with occasional Low Woodland of Eucalyptus pleurocarpa. Common species include Allocasuarina microstachya, Melaleuca leuropoma, Melaleuca trichophylla, and Verticordia spp. over sedges on grey-brown sands, sandy clays and or gravel on flats, swales and lower slopes. This FCT (Floristic Vegetation Type) was always associated with areas of FCT 2a.</p> |
| Type of environmental value | Species (flora/fauna) | Zanda latirostris - Carnaby's Black Cockatoo foraging habitat. |
| Conservation significance of environmental value | Rare/threatened species - endangered | Zanda latirostris - Carnaby's Black Cockatoo (Vulnerable). |
| Landscape-level value impacted | yes/no | No. |
| Significant Impact | | |
| Description | Zanda latirostris (Carnaby's Cockatoo) significant foraging habitat | <p>Survey undertaken by Umwelt identified the following vegetation associations containing known cockatoo foraging habitat:</p> <p>FCT 1a: Open Low Woodland to Open Low Scrub of Eucalyptus pleurocarpa and/or Eucalyptus todtiana over mixed shrubs dominated by Banksia spp. and Hakea spp. over sedges on grey to brown sands with very occasional laterite influence on lower to mid slopes</p> <p>FCT 2a: Low Woodland of Banksia attenuata and occasional Banksia menziesii and Xylomelum angustifolium over Low Scrub of mixed species including Banksia leptophylla var. leptophylla, Banksia candolleana, Melaleuca leuropoma and Hibbertia hypericoides on brown or grey sand on upper slopes;</p> <p>FCT 2b: Scrub of Banksia attenuata, with emergent Eucalyptus todtiana or Eucalyptus pleurocarpa, over Low Scrub dominated by Banksia spp. on predominantly yellow sands on mid and upper slopes;</p> <p>FCT 6b: Shrublands and Heaths, with occasional Low Woodland of Eucalyptus pleurocarpa. Common species include Allocasuarina microstachya, Melaleuca leuropoma, Melaleuca trichophylla, and Verticordia spp. over sedges on grey-brown sands, sandy clays and or gravel on flats, swales and lower slopes. This FCT (Floristic Vegetation Type) was always associated with areas of FCT 2a.</p> |
| Significant impact (hectares) / Type of feature | 3.00 | 3.00 hectares of critical Black Cockatoo foraging habitat within the application area. The remaining 0.3 hectares of the application area is already cleared. |
| Quality (scale) / Number | 8.00 | Approximately 78% of the application area is in Excellent Condition (given a rating of 8-9. Approximately 15% is in Degraded Condition (given a rating of 2-3). Approximately 9% of the application area is in Completely Degraded Condition (given a rating of 0-1). In addition, the vegetation within the proposed area to be cleared consists of high quality foraging habitat. |
| Rehabilitation credit | | |
| Description | Rehabilitation condition as per permit condition (within state agreement) | The proposed area to be cleared will be revegetated at the end of the operations (~25 years) therefore the rehabilitation credit is not appropriate. |
| Proposed rehabilitation (area in hectares) | 0.00 | |
| Current quality of rehabilitation site / Start number (of type of feature) | 0.00 | |
| Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation | 0.00 | |
| Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation | 0.00 | |
| Time until ecological benefit (years) | 0.00 | |
| Confidence in rehabilitation result (%) | 0 | |
| Offset | | |
| Description | Revegetation of 5.3 hectares of agricultural land adjacent existing Crown land near the Eneabba town. | Revegetation of agricultural land. |
| Proposed offset (area in hectares) | 5.27 | As quantified by the calculator. |
| Current quality of offset site / Start number (of type of feature) | 0.00 | Currently completely degraded and used as agricultural land for grazing. |
| Future quality WITHOUT offset (scale) / Future number WITHOUT offset | 0.00 | The area's quality is not considered to degrade further if no planting or VCN was placed as the area will remain agricultural land for grazing in the future. |
| Future quality WITH offset (scale) / Future number WITH offset | 6.00 | The area's quality is considered to improve given the proposed revegetation and monitoring and management measures were implemented. |
| Time until ecological benefit (years) | 12.00 | Whilst Iluka have provided evidence that rehab can be well established in 7 years, the amount of flowering material that provides suitable calorific value to meet a quality score of 6 should be increased to 12 (2 years to establish revegetation and 10 years to provide sufficient foraging value). |
| Confidence in offset result (%) | 0.9 | Iluka have proven they implement appropriate rehabilitation and environmental management measures. |
| Duration of offset implementation (maximum 20 years) | 20.00 | Noting the proposal is to be under a conservation covenant, the maximum timeframe of 20 years should be used. |
| Time until offset site secured (years) | 3.00 | The proposed offset area is currently paddock. A conservation covenant is not able to be placed on land that does not currently contain native vegetation. 3 years is used to allow for reveg to become established and then the process of applying for a covenant. |
| Risk of future loss WITHOUT offset (%) | 15.0% | Background risk of loss. |
| Risk of future loss WITH offset (%) | 5.0% | Low risk of future loss once a covenant is placed on the revegetation. |
| Offset ratio (Conservation area only) | N/A | |

Appendix F. Biological survey information excerpts - Likelihood of Occurrence of Further Significant Flora Taxa in the Survey Area (Umwelt, 2023)

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|---|-------------|---------------|-----------------------|---|------------------------------------|-----------------------------|---|--|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Acacia epacantha</i> | P3 | | July–August | Breakaways, slopes, flats and along drainage lines with gravelly sand or clay loam over laterite | - | Y | 7.2 km to east | Unlikely – similar habitat to that preferred may be present in the Survey Area, but habitat at nearest known location not present in Survey Area |
| <i>Acacia flabellifolia</i> | P3 | | August–September | Low hills and ridges with rocky loam, lateritic gravelly soils | 8c [^] , 12a [^] | Y | 3.0 km to south | Unlikely – similar habitat to that preferred may be present in the Survey Area, but habitat at nearest known location not present in Survey Area |
| <i>Acacia lasiocarpa</i> var. <i>lasiocarpa</i> Cockleshell Gully variant (E.A. Griffin 2039) | P2 | | August–October | Undulating sandplains, flats and breakaways with grey-yellow sand and laterite | 7 [^] , CL | Y | 3.8 km to west | Unlikely – while Survey Area occurs within known range, habitat is unlikely to be present. Taxon not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Acacia retrorsa</i> | P2 | | August–September | Slopes, gullies and flats with grey or brown sand, sandy loam or clay loam over laterite, gravelly and sometimes rocky. Eucalyptus or <i>Corymbia calophylla</i> woodland | - | Y | 10.4 km to southeast | Unlikely – habitat unlikely to be present, and nearest known location represents most northerly extent of known range |
| <i>Acacia telmica</i> | P3 | | July–September | Low-lying seasonally moist areas on sand, loam or loamy clay | - | Y | 9.6 km to west | Unlikely – habitat not considered to be present |
| <i>Acacia vittata</i> | P2 | | June–August, November | Margins of seasonal lakes with grey or brown sand or sandy clay | - | Y | 9.9 km to west | Unlikely – habitat not considered to be present |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|---|-------------|---------------|--------------------|---|---|-----------------------------|---|--|
| | | | | WA Herbarium (1998-)* | FCTs* | | | |
| <i>Acacia wilsonii</i> | T | EN | November–March | Hilltops, slopes and breakaways with gravelly brown, grey or yellow sand or clay loam over laterite or occasionally sandstone | - | Y | 11.5 km to east | Unlikely – habitat not considered to be present |
| <i>Allocasuarina grevilleoides</i> | P3 | | September–November | Slopes, outcrops and plains with rocky or gravelly brown sand or clay loam over laterite or granite | 1a~, 7^ | Y | 15.6 km to south | Unlikely – habitat not considered to be present |
| <i>Allocasuarina ramosissima</i> | P3 | | May–September | Breakaways, slopes and plains with gravelly grey, brown or white sand or loam over laterite | 7^, 14 | Y | 6.9 km to southeast | Unlikely – while Survey Area occurs within known range, habitat is unlikely to be present. Taxon not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Andersonia gracilis</i> | T | EN | August–November | Winter-wet areas, near swamps. White-grey sand, sandy clay and gravelly loam | - | Y | 75.2 km to southeast | Unlikely – habitat not considered to be present, nearest known location represents most northerly extent of known range |
| <i>Banksia elegans</i> | P4 | | October–November | Sandplains, low consolidated dunes with yellow sand | 1a~, 1b~, 2a~, 2b~, 3~, 4^, 5a^, 5b, 6a, 10a, 10b, 16a, 16b, 23, 24, CL | Y | 2.9 km to north | Unlikely – habitat not considered to be present |
| <i>Banksia fraseri</i> var. <i>crebra</i> | P3 | | July–August | Lateritic hilltops, slopes, plains and valleys with yellow, grey or brown gravelly sand over laterite | - | Y | 9.1 km to east | Unlikely – habitat not considered to be present |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|---|-------------|---------------|-------------------|--|------------------------------------|-----------------------------|---|---|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Banksia kippistiana</i> var. <i>paenepeccata</i> | P3 | | October–November | Hills and slopes with white-yellow or grey sand over laterite | - | Y | 2.9 km to north | Unlikely – while Survey Area occurs on boundary of known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Banksia nana</i> | P3 | | October | Hills with white/grey sand and/or gravel over laterite | 7 [^] | Y | 27.9 km to southeast | Unlikely – habitat possibly present, but nearest known location represents most northerly extent of known range |
| <i>Beyeria gardneri</i> | P3 | | August–September | Sandplains and hillsides with yellow sand | 2a ^{^^} , 6a [^] | Y | 1.3 km to south | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Beyeria similis</i> | P2 | | August–September | Sandplains, slopes or sandstone ridges with white, yellow or red clayey sand | 1b ^{^^} | Y | 1.4 km to south | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|-----------------------------|-------------|---------------|--------------------|--|------------------------------------|-----------------------------|---|--|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Calytrix purpurea</i> | P2 | | September–December | Sandplains and sand dunes with white, grey or yellow sand, often over laterite | - | Y | 3.8 km to southwest | Unlikely – habitat possibly present, but Survey Area occurs outside known, verified distribution. The validity of the record 3.8 km from Survey Area is questionable. Closest known, verified location to Survey Area located approximately 76 km to northeast |
| <i>Caustis gigas</i> | P2 | | May | Flats and depressions with white or grey sand | - | Y | 24.5 km to southeast | Unlikely – habitat possibly present, but nearest known location represents most northerly extent of known range |
| <i>Centrolepis milleri</i> | P3 | | September–October | Sandplains with grey-white sand or sandy clay | 6c [^] | Y | 6.3 km to northwest | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Chordifex reseminans</i> | P2 | | March–May | Flats and winter-wet depressions with white-grey sand over laterite | 2b [~] , 6b ^{^^} | Y | 2.0 km to northwest | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|---|-------------|---------------|--------------------|---|--|-----------------------------|---|---|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Comesperma griffinii</i> | P2 | | August–January | Slopes, plains, open depressions and flats with grey or brown sand or light clay, sometimes with laterite | 2b ^{^^} , 6c [^] , 10b [^] | Y | 5.9 km to south | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Comesperma rhadinocarpum</i> | P3 | | October–November | Undulating plains, valley slopes and flats with grey, brown or yellow sandy loam or sand | 1b ^{^^} , 1c [^] , 2b ^{^^} , 17b [^] | Y | 1.4 km to south | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Conospermum scaposum</i> | P3 | | September–February | Winter-wet flats and depressions with white, brown or grey sand | 1a ^{^^} , 1b ^{^^} | Y | 16.8 km to southwest | Unlikely – nearest known location to Survey Area is erroneous; locality description states it occurs on Munbinea Road, 4.5 km north of Wongonderrah Road. This places it approximately 73.3 km south of the Survey Area. Closest known, verified location to Survey Area located approximately 58.9 km to southeast |
| <i>Cristonia biloba</i> subsp. <i>pubescens</i> | P2 | | June–July | Hillslopes and ridges with white sand or brown loam and gravel | 1b ^{^^} | Y | 1.4 km to south | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|---|-------------|---------------|-------------------|---|----------------------|-----------------------------|---|---|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Daviesia debilior</i> subsp. <i>debilior</i> | P2 | | May–July | Plains with white-grey sand over laterite | 1a~, 2a~, 2b~, 7^, R | Y | 1.2 km to south | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Daviesia pteroclada</i> | P3 | | July–August | Hills and slopes with sandy or clay gravelly soils over laterite | - | Y | 6.4 km to west | Unlikely – habitat not considered to be present. The validity of the record 6.4 km from Survey Area is questionable. Closest known, verified location to Survey Area located approximately 17.8 km to southwest |
| <i>Daviesia speciosa</i> | T | EN | April–December | Breakaways, hilltops, and slopes with gravelly grey, brown or white sand or clay loam over laterite | - | Y | 21.6 km to east | Unlikely – ha habitat not considered to be present, nearest known location represents most south-westerly extent of known range |
| <i>Desmocladius biformis</i> | P3 | | September–October | Hills, slopes and undulating plains with white or brown sand or sandy clay over laterite | 9^ | Y | 3.1 km to south | Unlikely – while Survey Area occurs within known range, habitat is unlikely to be present. Taxon not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Drosera prophylla</i> | P3 | | June–July | Hilltops, lateritic breakaways and ridges and slopes with gravelly sand over laterite | - | Y – September trip only | 9.1 km to southeast | Unlikely – habitat unlikely to be present and Survey Area is out of known range |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|--|-------------|---------------|-------------------|--|-------------------------------------|-----------------------------|---|---|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Eleocharis keigheryi</i> | T | VU | August–November | Emergent in freshwater: creeks and claypans with clay or sandy loam | - | Y | 22.9 km to southwest | Unlikely – habitat not considered to be present |
| <i>Eremophila glabra</i> subsp. <i>chlorella</i> | T | EN | July–November | Winter-wet depressions, lake edges and flats with grey-white sandy clay or sand | 8c, 9, 12a, 12b [^] | Y | 2.8 km to south | Unlikely – habitat not considered to be present |
| <i>Eremophila subangustifolia</i> | T | CR | August–September | Lake/creek edges, claypans and winter wet flats with brown, white or grey sand, sandy clay or sandy loam | - | Y | 8.0 km to west | Unlikely – habitat not considered to be present |
| <i>Eucalyptus crispata</i> | T | VU | March–June | Lateritic breakaways and slopes with brown-grey sand or loam with lateritic gravel | 2a ^{^^} , 2b ^{^^} | Y | 1.5 km to north | Unlikely – habitat not considered to be present |
| <i>Eucalyptus exilis</i> | P4 | | August–October | Hills, breakaways and slopes with grey or yellow gravelly sand or clay loam | R | Y | 19.1 km to south | Unlikely – Survey Area out of known range |
| <i>Eucalyptus ximpensa</i> | T | EN | August–November | Hilltops, slopes and plains with grey, brown or white gravelly clay loam over laterite | 7 [^] | Y | 3.4 km to southeast | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|---|-------------|---------------|-------------------|---|--|-----------------------------|---|--|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Eucalyptus johnsoniana</i> | T | VU | July–May | Sandplains and lateritic breakaways with white-grey sand with lateritic gravel | 1a [~] , 2a [~] , 2b [~] , 7 [^] , R | Y | 0.5 km to north | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Eucalyptus leprophloia</i> | T | EN | July, November | Breakaways and slopes with grey or white sand or sandy clay over laterite | - | Y | 26.5 km to south-southeast | Unlikely – habitat not considered to be present |
| <i>Eucalyptus rhodantha</i> var. <i>rhodantha</i> | T | VU | July–January | Hillslopes, breakaways and gentle slopes with grey, yellow or brown sand, sometimes over laterite | - | Y | 6.7 km to northwest | Unlikely – similar habitat possibly present, but Survey Area occurs outside known, verified distribution. The validity of the record 6.7 km from Survey Area is questionable. Closest known, verified location to Survey Area located approximately 41 km to northeast |
| <i>Eucalyptus suberea</i> | T | VU | November–March | Breakaways and slopes with white gravelly sand over laterite | 2b [~] , 7 [^] | Y | 7.9 km to south-southeast | Unlikely – habitat not considered to be present, nearest known location represents most northerly extent of known range. This record is relatively disjunct from all other records and may be erroneous |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|--|-------------|---------------|-------------------------|---|--|-----------------------------|---|---|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Eucalyptus zopherophloia</i> | P4 | | October–January | Slopes and dunes with brown, grey or white sand with and over limestone. Often in coastal areas | 17a [^] | Y | 2.8 km to north | Unlikely – habitat not considered to be present, and Survey Area is located outside of known, verified range. Closest known location to Survey Area is erroneous; locality description places it 22.4 km from Eneabba (direction not provided). Next closest record is located 11.5 km northeast of Survey Area |
| <i>Frankenia glomerata</i> | P4 | | November | Salt lake edges, watercourses and flats with white sand or grey-brown sandy loam | - | Y | 8.0 km to west | Unlikely – habitat not considered to be present |
| <i>Grevillea althoferorum</i> subsp. <i>althoferorum</i> | T | EN | September–November | Low rises and slopes with yellow-brown or grey sand | 2a [~] , 2b [~] , 6a, 7 [^] , 9, CL | Y | 1.9 km to south | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Grevillea amplexans</i> subsp. <i>adpressa</i> | P1 | | September | Slopes with yellow or white sand, sometimes over laterite | CL, R | Y | 11.0 km to southeast | Unlikely – habitat possibly present, but Survey Area occurs northwest of known range |
| <i>Grevillea humifusa</i> | T | EN | May, September–November | Slopes with brown gravelly loam over laterite | - | Y | 30.0 km to southwest | Unlikely – habitat possibly present, but nearest known location represents most northerly extent of known range, taxon has a relatively restricted distribution |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|--|-------------|---------------|----------------------------|---|--|-----------------------------|---|---|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Grevillea leptopoda</i> | P3 | | June–October | Hills and slopes with brown, red or yellow sand or clay loam, sometimes over laterite or occasionally granite | 1b [^] , CL, R | Y | 15.3 km to northeast | Unlikely – habitat possibly present, but nearest known location represents most westerly extent of known range |
| <i>Grevillea olivacea</i> | P4 | | June–September | Coastal dunes and limestone rocks with white or grey sand | - | Y | 17.4 km to south | Unlikely – habitat not considered to be present, nearest known location to Survey Area is likely erroneous; known distribution is coastal and near-coastal areas |
| <i>Grevillea thyrsoides</i> subsp. <i>thyrsoides</i> | P3 | | February, August–September | Hills and plains with grey, white or brown sand or clay loam, often with laterite | 7 [^] | Y | 1.2 km to east | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Grevillea uniformis</i> | P3 | | July–November | Hills, slopes and breakaways with grey or brown sand or sandy loam with sandstone or laterite | 1a [^] , 2b [^] , 7 [^] , 14, CL, R | Y | 0.2 km to west | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Guichenotia alba</i> | P3 | | July–August | Low-lying flats and depressions with brown sandy and gravelly soils | 2a [^] , 5a [^] , 6c | Y | 6.0 km to west | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|----------------------------|-------------|---------------|--------------------|--|---|-----------------------------|---|---|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Hakea longiflora</i> | P3 | | June–July | High in landscape; hills, breakaways and plains with white, grey or yellow gravelly sand or sandy loam over laterite or occasionally sandstone | 14 [^] | Y | 9.6 km to southeast | Unlikely – habitat not considered to be present |
| <i>Hakea megalosperma</i> | T | VU | April–June | High in landscape; hills, breakaways, slopes and flats with white, grey or brown sand or sandy loam over laterite | - | Y | 5.7 km to southeast | Unlikely – habitat not considered to be present |
| <i>Hemiandra gardneri</i> | T | EN | August–November | Plains with yellow or grey sand or clayey sand | - | Y | 34.2 km to southwest | Unlikely – habitat possibly present, but nearest known location represents most northerly extent of known range |
| <i>Hensmania stoniella</i> | P3 | | September–November | Sandplains, flats and slopes with white, grey or lateritic sand | 1a [^] , 2a [^] , 2b [^] , 3 [^] , CL | Y | 0.2 km to north | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Hibbertia propinqua</i> | P4 | | August–September | Slopes and breakaways with grey-brown sand with laterite or sandstone | 2b [^] , 9 [^] , 14 [^] | Y | 2.1 km to south | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|-------------------------------------|-------------|---------------|--------------------|---|---|-----------------------------|---|---|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Hibbertia subglabra</i> | P3 | | September–October | Slopes of hills with grey or white sand and lateritic gravel | 1b [^] , CL | Y | 1.4 km to south | Unlikely – while Survey Area occurs on boundary of known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Jacksonia anthoclada</i> | P3 | | November | Slopes with brown, yellow or white sand over laterite | 2b [^] , 7 | Y | 4.2 km to southeast | Unlikely – while Survey Area occurs on boundary of known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Lepidobolus densus</i> | P4 | | August | Sandplains, lake edges and slopes with brown or yellow sand | 1c [^] , 3 [^] , 12a [^] | Y | 3.5 km to south | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Lepidobolus quadratus</i> | P3 | | August–September | Dry kwongan, hillslopes and rises with grey-white sand and lateritic gravel | 1a [^] , 2a [^] , 2b [^] , 7 [^] , 14, CL | Y | 1.4 km to south | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Liparophyllum congestiflorum</i> | P4 | | September–November | Flats, swamps and drainage lines with grey sandy clay or sand | 24 [^] , CL | Y | 3.2 km to south | Unlikely – habitat not considered to be present |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|---|-------------|---------------|--------------------|--|--|-----------------------------|---|---|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Mesomelaena stygia</i> subsp. <i>deflexa</i> | P3 | | March–October | Sandplains and slopes with white-grey lateritic sand or clay | 1a ^{~^} , 1b [~] , 2a [~] , 2b [~] , 3 [~] , 6a, 7 [^] , 9, 14, R | Y | 0.2 km to north | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Micromyrtus uniovulum</i> | P2 | | November | Ridges, hilltops and slopes with grey or brown sand or clay loam over laterite | CL | Y | 9.9 km to north | Unlikely – habitat unlikely to be present, and nearest known location represents most southerly extent of known range |
| <i>Patersonia argyrea</i> | P3 | | September–November | Hills, slopes and plains with grey sand and lateritic gravel | 6b ^{^^} | Y | 8.9 km to south | Unlikely – habitat possibly present, but Survey Area is out of known range |
| <i>Persoonia rudis</i> | P3 | | September–January | Sandplains and flats with white, grey or yellow sand, often over laterite | 1a ^{^^} , 1b [~] , 2a [~] , 2b [~] , 3 [~] , 4, 5a [^] , 5b, 6c, 7, CL | Y | 0.02 km to south | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Petrophile septemfida</i> | P3 | | July–September | Hillsides, uplands and plains with grey-white sand, often over laterite | - | Y | 2.8 km to north | Unlikely – habitat possibly present, but Survey Area occurs outside known, verified distribution. Closest known location to Survey Area is likely erroneous; locality description is 'Eneabba' and has therefore been plotted at Eneabba town site. Next closest record is approximately 15.9 km southeast of Survey Area |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|--|-------------|---------------|--------------------|---|---|-----------------------------|---|---|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Phlebocarya pilosissima</i> subsp. <i>pilosissima</i> | P3 | | August–October | Slopes with sand over laterite | - | Y | 8.3 km to east | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Pityrodia viscida</i> | P4 | | September–February | Hillslopes, uplands and sandplains with grey, white or yellow sand, sometimes with lateritic gravel | 1a ^{^^} , 2a ^{^^} , 2b ^{^^} , 3 ^{^^} , 6a, CL | Y | 2.0 km to south | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Platysace ramosissima</i> | P3 | | October–November | Undulating plains and flats with yellow, brown or grey sand | 3 ^{^^} | Y | 1.0 km to south | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Ptilotus clivicola</i> | P2 | | November | Hills and slopes with grey or white gravelly sand over laterite | 7 [^] | Y | 4.3 km to south | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|--|-------------|---------------|--------------------|---|---|-----------------------------|---|---|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Scaevola eneabba</i> | P2 | | February, November | Swales and flats with grey-white sand | 6a, 6b ^{^^} | Y | 1.8 km to northwest | Unlikely – while Survey Area occurs on boundary of known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Schoenus</i> sp. Eneabba (F. Obbens & C. Godden 1154) | P2 | | November–December | Undulating sandplains, mid slopes and tops of rises with grey, yellow or white sand | 1a [~] , 1b [~] , 2a [~] , 2b ^{^^} , 3 [~] , 4 [^] , 5a [^] , 5b, CL, D, R | Y | 1.5 km to north | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Spirogardnera rubescens</i> | T | EN | August–January | Slopes and plains, gravelly sandy loam | - | Y | 32.0 km to southeast | Unlikely – habitat possibly present, but nearest known location represents the most northerly extent of known range |
| <i>Stawellia dimorphantha</i> | P4 | | June–November | Undulating plains and slopes with yellow sand | 3 [~] , 4 [^] , 5a [^] , 5b [^] , 16a [^] , 16b, 17a, 17b, CL | Y | 2.8 km to north | Unlikely – habitat not considered to be present |
| <i>Stylidium drummondianum</i> | P3 | | August–October | Upper hillslopes and breakaways, low heath or mallee shrubland on sand or clayey sand over laterite | 7 [^] , 9 [^] | Y | 3.1 km to south | Unlikely – while Survey Area occurs within known range, habitat is unlikely to be present. Taxon not recorded in Survey Area despite intensive survey conducted by the 2022 survey |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|--------------------------------|-------------|---------------|--------------------|---|--|-----------------------------|---|---|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Stylidium inversiflorum</i> | P4 | | September–November | Sandplains, hillslopes and gullies, heath, open woodland on white or grey sand over laterite | 1a [^] , 2b [^] | Y | 6.7 km to southwest | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Stylidium torticarpum</i> | P3 | | September–November | Adjacent to drainage lines, depressions, and beneath breakaways, heath or mallee shrubland on sandy clay or clay loam over laterite | 9 [^] , 12a [^] , 14 [^] , 15a [^] , CL | Y | 2.1 km to south | Unlikely – while Survey Area occurs within known range, habitat is unlikely to be present. Taxon not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Styphelia longissima</i> | T | CR | June–September | Hillsides with gentle slopes and yellow sand | 1b [^] , CL | Y | 6.5 km to north-northeast | Unlikely – habitat not considered to be present |
| <i>Styphelia obtecta</i> | T | EN | October–November | Plains with white, grey or yellow sand | 1a [^] , 1c [^] , 2a [^] , 2b [^] , 4, 6b [^] , CL, R | Y | 1.0 km to south | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Synaphea endothrix</i> | P3 | | July–October | Ridges and hills with brown, yellow or white gravelly sand over laterite | 2b [^] | Y | 4.5 km to south | Unlikely – habitat possibly present, but nearest known location likely erroneous. Next closest record is located 27.7 km southeast of Survey Area |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|---|-------------|---------------|---------------------|---|---|-----------------------------|---|--|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Synaphea oulopha</i> | P3 | | July–October | Lateritic breakaways, slopes and rises with grey sand, gravelly loam or clay | 9 [^] | Y | 3.9 km to south | Unlikely – habitat possibly present, but Survey Area is out of known range; closest location to Survey Area has erroneous coordinates and should be located further north. Next closest record is approximately 16.7 km northeast of Survey Area |
| <i>Tetradlea nephelioides</i> | T | CR | July–January | Slopes and ridges with white or grey gravelly sand over laterite | 1a [~] , 2b [~] , 7 [^] , CL | Y | 6.1 km to south | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Thelymitra stellata</i> | T | EN | October–November | Ridges and tops of lateritic hills with grey or brown sand or loam and lateritic gravel | 7 [^] | Y | 2.1 km to east | Unlikely – habitat not considered to be present |
| <i>Thysanotus vernalis</i> | P3 | | September – October | Slopes, flats and winter wet depressions with grey, brown or white sand with lateritic gravel over laterite | - | Y | 15.9 km to northeast | Unlikely – while Survey Area occurs within known range, habitat is unlikely to be present. Taxon not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Thysanotus</i> sp. Badgingarra (E.A. Griffin 2511) | P2 | | December–January | Slopes, uplands and flats with grey or white sand, sometimes with lateritic gravel | - | Y | 4.8 km to west | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|--|-------------|---------------|--------------------|--|-------------------|-----------------------------|---|--|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Verticordia albida</i> | T | EN | November–January | Undulating sandplains with grey, white or yellow sand, sometimes over laterite | - | Y | 2.9 km to east | Unlikely – habitat possibly present, but Survey Area is out of known range. Records near Eneabba have erroneous coordinates; this species is accepted as only occurring near Three Springs; closest known, verified record is approximately 42.9 km to northeast |
| <i>Verticordia densiflora</i> var. <i>roseostella</i> | P3 | | September–December | Sandplains and breakaways with yellow, grey or white sand or sandy loam, often with laterite | - | Y | 2.6 km to north | Unlikely – habitat possibly present, but Survey Area is out of known range. Records near Eneabba are erroneous; closest known, verified record is approximately 33.1 km to northeast |
| <i>Verticordia luteola</i> var. <i>rosea</i> | P1 | | December–January | Flats with white-grey sand | - | Y | 2.8 km to north | Unlikely – while Survey Area occurs within known range and habitat is possibly present, taxon was not recorded in Survey Area despite intensive survey conducted by the 2022 survey |
| <i>Verticordia muelleriana</i> subsp. <i>muelleriana</i> | P3 | | September–January | Sandplains and slopes with white-grey or yellow sand | 3 [^] | Y | 2.1 km to south | Unlikely – habitat possibly present, but Survey Area is out of known range. Records on Northern Sandplains are unverified and/or erroneous; closest known, verified record is approximately 22.5 km to east |

| Taxon | Status (WA) | Status (EPBC) | Flowering Period* | Habitat | | Identifiable During Survey? | Nearest Location to Survey Area (DBCA Databases) ⁵ | Likelihood of Occurrence |
|---------------------------------|-------------|---------------|--------------------|--|---|-----------------------------|---|--|
| | | | | WA Herbarium (1998-)* | FCTs [#] | | | |
| <i>Verticordia penicillaris</i> | P4 | | September–October | Hills, rocky creeks and outcrops with shallow grey or brown sandy loam or clay loam, often with granite or sometimes laterite or sandstone | - | Y | 2.8 km to north | Unlikely – habitat not considered to be present. Closest known location to Survey Area is erroneous; locality description says 'NE of Eneabba' but does not provide a distance and is therefore plotted at Eneabba townsite. All other records are at least 32 km north-northeast of Survey Area |
| <i>Verticordia rutilastra</i> | P3 | | September–November | Lateritic breakaways and slopes with white or brown gravelly sand or sandy loam | 14 [^] | Y | 19.2 km to south | Unlikely – habitat not considered to be present, Survey Area north of known range |
| <i>Walteranthus erectus</i> | P2 | | February | Coastal limestone ridges with sand over limestone | - | Y | 2.9 km to north | Unlikely – habitat not considered to be present. Closest known location to Survey Area is likely erroneous; record is from 1963 with a locality description 'Eneabba Flora Reserve', but record has been plotted at Eneabba town site. All other records are at least 15 km to west of Survey Area and are associated with coastal limestone |
| <i>Xanthosia tomentosa</i> | P4 | | September–December | Undulating sandplains, tops of hills and ridges with white-grey sand, lateritic gravelly soils over laterite | 1a [~] , 2b [~] , 7 [^] , CL | Y | 2.8 km to north | Unlikely – habitat not considered to be present |



Plate 1: Fruiting *Banksia* species present following rehabilitation works undertaken in 2013 at 82 Strand (east of application area).



Plate 2: Fruiting *Banksia* species present following rehabilitation works undertaken in 2013 at 82 Strand (east of application area).



Plate 3: Fruiting *Banksia* species present following rehabilitation works undertaken in 2017 at South Tails (south of the application area).



Plate 4: Fruiting *Banksia* species present following rehabilitation works undertaken in 2017 at South Tails (south of the application area).



Plate 5: Fruiting *Banksia* species present following rehabilitation works undertaken in 2017 at South Tails (south of the application area).



Plate 6: Fruiting *Banksia* species present following rehabilitation works undertaken in 2017 at South Tails (south of the application area).



Plate 7: Fruiting *Banksia* species present following rehabilitation works undertaken in 2017 at South Tails (south of the application area).



Plate 8: Fruiting *Banksia* species present following rehabilitation works undertaken in 2017 at South Tails (south of the application area).



Plate 9: Fruiting *Eucalyptus* species present following rehabilitation works undertaken in 2017 at South Tails (south of the application area).



Plate 10: Fruiting *Allocasuarina* species present following rehabilitation works undertaken in 2017 at South Tails (south of the application area).



Plate 11: Fruiting *Eucalyptus* species present following rehabilitation works undertaken in 2017 at South Tails (south of the application area).



Plate 12: Fruiting *Hakea* species present following rehabilitation works undertaken in 2017 at South Tails (south of the application area).



Plate 13: Fruiting *Hakea* species present following rehabilitation works undertaken in 2017 at South Tails (south of the application area).



Plate 14: Fruiting *Banksia* species present following rehabilitation works undertaken in 2017 at South Tails (south of the application area).



Plate 15: Fruiting *Banksia* species present following rehabilitation works undertaken in 2017 at South Tails (south of the application area).



Plate 16: Location of photos of rehabilitation from the 82 Strand and South Tails Location (Plate 1-14). The red areas indicate the area within which conditional authorised clearing can occur under the granted clearing permit.

Appendix H. Sources of information

H.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Bush Forever (Regional Scheme) (DPLH-022)
- Cadastre (LGATE-218)
- Contours (DPIRD-073)
- Clearing Regulations – Schedule One Areas (DWER-057)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Environmentally Sensitive Areas (DWER-046)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- 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:

- Black Cockatoo WTBC Breeding
- Black Cockatoo FRTBC Breeding
- Black Cockatoo BC Roosts
- Black Cockatoo BC Feeding SCP
- Black Cockatoo Feeding JF
- Black Cockatoo Feeding Areas Buffered
- Black Cockatoo Baudins Distribution
- Black Cockatoo Forest Red Tail Distribution
- Black Cockatoo Carnabys Distribution
- 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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5. Glossary

Acronyms:

| | |
|-----------------|---|
| BC Act | <i>Biodiversity Conservation Act 2016</i> , Western Australia |
| BoM | Bureau of Meteorology, Australian Government |
| DAA | Department of Aboriginal Affairs, Western Australia (now DPLH) |
| DAFWA | Department of Agriculture and Food, Western Australia (now DPIRD) |
| 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 |
| DER | Department of Environment Regulation, Western Australia (now DWER) |
| DMIRS | Department of Mines, Industry Regulation and Safety, Western Australia (now DEMIRS) |
| DMP | Department of Mines and Petroleum, Western Australia (now DMIRS) |
| 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 | <i>Environmental Protection Act 1986</i> , Western Australia |
| EPA | Environmental Protection Authority, Western Australia |
| EPBC Act | <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act) |
| GIS | Geographical Information System |
| ha | Hectare (10,000 square metres) |
| IBRA | Interim Biogeographic Regionalisation for Australia |
| IUCN | International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union |
| PEC | Priority Ecological Community, Western Australia |
| RIWI Act | <i>Rights in Water and Irrigation Act 1914</i> , Western Australia |
| TEC | Threatened Ecological Community |

Definitions:

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

T

Threatened species:

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

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

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

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

CR

Critically endangered species

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

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

EN

Endangered species

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

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

VU

Vulnerable species

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

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

Extinct Species:

EX

Extinct species

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

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

EW

Extinct in the wild species

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

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

Specially protected species:

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

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

MI

Migratory species

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

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

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

CD Species of special conservation interest (conservation dependent fauna)

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

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

OS Other specially protected species

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

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

P Priority species:

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

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

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

P1 Priority One - Poorly-known species

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

P2 Priority Two - Poorly-known species

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

P3 Priority Three - Poorly-known species

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

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

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

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

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

Principles for clearing native vegetation:

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