



Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

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|------------------------|------------------------------|
| Permit number: | 9749/1 |
| Permit type: | Purpose Permit |
| Applicant name: | Bulletin Resources Limited |
| Application received: | 24 May 2022 |
| Application area: | 2.3 hectares |
| Purpose of clearing: | Mineral exploration |
| Method of clearing: | Mechanical Removal |
| Tenure: | Exploration Licence 74/655 |
| Location (LGA area/s): | Shire of Ravensthorpe |
| Colloquial name: | Ravensthorpe Lithium Project |

1.2. Description of clearing activities

Bulletin Resources Limited proposes to clear up to 2.3 hectares of native vegetation within a boundary of approximately 22 hectares, for the purpose of mineral exploration. The project is located approximately 12.5 kilometres southwest of Ravensthorpe, within the Shire of Ravensthorpe.

The application is to allow for mineral exploration activities targeting lithium. The proposed clearing is via raised blade, including areas of cut and fill excavation.

1.3. Decision on application and key considerations

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|----------------|-----------------------------------|
| Decision: | Refuse |
| Decision date: | 4 April 2024 |
| Decision area: | 2.3 hectares of native vegetation |

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act). Department of Mines, Industry Regulation and Safety (now the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advertised the application for public comment for a period of 21 days, and 52 submissions were received. Consideration of the matters raised in the submissions is provided in Appendix B.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix C), relevant datasets (Appendix G), supporting information provided by the applicant (Appendix A) including information from a flora and vegetation survey (Appendix F), the clearing principles set out in Schedule 5 of the EP Act (Appendix D), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3).

The assessment identified that the proposed clearing will result in:

- the loss of native vegetation that is critical habitat for Carnaby's black-cockatoo and numbat;
- the loss of native vegetation that is suitable habitat for malleefowl, chuditch, heath mouse, and red-tailed phascogale;
- the loss of native vegetation that is significant as a remnant of native vegetation in an area that has been extensively cleared, including impacts to a significant ecological corridor that the remnant provides;
- impacts to the conservation values of the Cocanarup timber reserve;
- impacts to riparian vegetation;
- the potential introduction and spread of weeds and dieback into adjacent vegetation which contains suitable habitat for several conservation significant flora, and also impact on the quality of the adjacent vegetation and its habitat values; and
- the potential land degradation in the form of wind erosion.

The Delegated Officer noted that a re-assessment of the biological surveys was undertaken by Talis Consultants (2024), on behalf of the applicant as part of the response to the notice of intent to refuse issued by the department. Talis Consultants believed the

proposal is not at variance or unlikely to be at variance with the 10 Clearing Principles of the *Environmental Protection Act 1986* (Talis, 2024). No offset proposal was provided in the response to the department's correspondence.

After consideration of the available information, including further information provided by the applicant on 29 February 2024, as well as the applicant's minimisation and mitigation measures (see Section 3.1); the Delegated Officer determined the proposed clearing is likely to lead to long-term adverse impacts on the conservation, survival and viability of breeding and feeding habitat for the Carnaby's cockatoo within the local and regional context. The Delegated Officer also determined that the proposed clearing will impact habitat that is critical for the long term viability of numbats. The flora, fauna, land resources, significant remnant vegetation and conservation areas will be impacted and cannot be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

Noting the above, the Delegated Officer determined to refuse to grant a clearing permit.

2. Legislative context

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

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

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

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Mining Act 1978* (WA)
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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 Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA, 2020)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

On 12 October 2023, after advice from the Environmental Protection Authority, the applicant revised their original footprint from a proposed clearing of 7 hectares of native vegetation within a footprint of approximately 222 hectares to a proposed clearing of 2.3 hectares of native vegetation within a footprint of approximately 22 hectares. This change is reflected in Figure 10 of Appendix F.

The applicant has advised that exploration activities will be implemented in accordance with an Exploration Environmental Management Plan (Talis, 2023). The Exploration Environmental Management Plan includes management actions such as (Bulletin Resources, 2023):

- Pre Exploration:
 - Demarcation of approved clearing areas in accordance with internal 'Ground Disturbance Permit' procedures
 - Avoid clearing by utilising existing disturbed or open areas
 - Local topography will be reviewed to inform track design and alignment to avoid or reduce the need for cut and fill construction methods, while ensuring safe and stable tracks and pads for exploration activities
 - Operator personnel will be familiarised with demarcated areas prior to clearing works commencing to ensure no clearing beyond demarcated clearing zones
 - Inspection of all vehicles and equipment prior to site arrival to ensure they are 'clean' of soil sods and weed seeds in accordance with hygiene procedures
 - Demarcation for avoidance of all potential habitat trees (>300 millimetres diameter at breast height) for Carnaby's Cockatoo, and the three recorded inactive malleefowl mounds, as well as pre-clearing site inspection to minimise clearing of vegetation
 - Establishment and demarcation of avoidance areas (locations of Priority 1 flora species *Lepidosperma* sp. Mt Chester and *L. ?* sp. Mt Chester)
- During Exploration:
 - Clearing will be conducted progressively so only those areas absolutely required for operations are disturbed

- Vegetation removal and separate stockpiling for rehabilitation
 - Raised blade clearing for access tracks where safe to do so
 - Limit vehicle speed in activity area to 40km/h to reduce potential of fauna strike
 - Implementation of the Dieback Management Plan
- Post-Exploration:
 - Rehabilitation of drill pads and tracks by:
 - removing all rubbish for off-site disposal
 - re-contouring of land surfaces and on-contour ripping of compacted ground
 - re-spreading of stockpiled soil and vegetation material
 - Following completion of the drilling program, all disturbed areas will be subject to rehabilitation. Rehabilitation will be undertaken per DEMIRS guidelines and include the following:
 - cut and fill drill pads and access tracks to be re-profiled back into the natural hillside/terrain
 - any sumps will be backfilled with excavated material, covered with topsoil, and cleared vegetation
 - disturbed areas will be reseeded with native species. Topsoil and all cleared vegetative material to be spread over disturbed surfaces
 - Monitoring of rehabilitation (photographic records) to confirm successful rehabilitation on an annual basis.

The Delegated Officer acknowledged the avoidance and mitigation efforts by the applicant, however, considers that a significant residual impact to fauna and remnant vegetation still remains.

It is noted that the applicant was willing to consider an offset, however did not provide a proposal in response to the department's notice of intent to refuse correspondence.

3.2. Assessment of impacts on environmental values

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

The assessment against the clearing principles identified that the impacts of the proposed clearing present a risk to biological values (fauna and flora).

3.2.1. Biological values (flora and vegetation) - Clearing Principle (a)

Assessment

According to available databases, there are records of 30 Priority flora species within 10 kilometres of the application area (see section C.3) (Biologic, 2022; GIS Database). Following the flora and vegetation survey conducted by Biologic (2022), one Priority flora was recorded in the application area, and the eight species listed below were deemed possible to occur in the application area. However, only limited suitable habitat was observed along the proposed drill lines and none of these individuals were found along the thoroughly searched drill lines (Biologic, 2022). The flora and vegetation survey was undertaken at the recommended timing for the southwest and followed the guidelines for a reconnaissance and targeted flora survey (EPA, 2016). If these species were to occur within the application area, they would be present across the broader, less intensely searched area away from the proposed drill lines (Biologic, 2022). For this reason, the proposed clearing is unlikely to significantly impact the priority flora listed below.

- *Acacia bifaria* (P3)
- *Austrostipa turbinata* (P3)
- *Notisia intonsa* (P3)
- *Levenhookia pulcherrima* (P3)
- *Eucalyptus desmondensis* (P4)
- *Melaleuca penicula* (P4)
- *Acacia besleyi* (P1)
- *Cassinia arcuata* (P2)

The application area contains Priority 1 flora, *Lepidosperma* sp. Mt Chester (Biologic, 2022). There was one flora species that could not be definitively identified and was determined as *L. ? sp.* Mt Chester. As a precautionary measure, this flora species was determined to be the Priority 1 species. After reducing the application area, only *Lepidosperma* sp. Mt Chester and *L. ? sp.* Mt Chester remain inside the application area. Approximately 20 individuals of *Lepidosperma* sp. Mt Chester and 10 individuals of *L. ? sp.* Mt Chester were found close to the drill line alignment (Biologic, 2022). The applicant has indicated that demarcation and avoidance of Priority flora will be undertaken (Bulletin Resources, 2023). The locations of the recorded Priority flora can be found in Figure 9 of Appendix F.

The initial clearing application area contained another Priority 1 flora species (*Lepidosperma* sp. Mt Short). This species has been avoided as a result of the revised alignment. Approximately 30 individuals of *Lepidosperma* sp. Mt Short (P1) were recorded at one site, 170 metres from the application area, and therefore away from the drill line alignment and the proposed clearing (Biologic, 2022). These plants are unlikely to be impacted by the proposed clearing. No Threatened flora are likely to be impacted by the proposed clearing.

Available databases show that the western and south-eastern sides of the application area intersect the Priority Ecological Community (PEC) 'Proteaceae Dominated Kwongan Shrubland'. However, the vegetation survey conducted by Biologic (2022) revealed that none of the vegetation types present in the application are representative of the PEC, due to the lack of flora species belonging to the Proteaceae family.

Two vegetation types recorded within the application area (EsEbAa and EsEb) contain salmon gum (*Eucalyptus salmonophloia*) trees. These vegetation types cover 9.713 hectares of the total application area (22.38 hectares), representing 43.4 per cent of the application area which has the potential to host salmon gums (GIS Database). Salmon gum woodlands are in serious decline in the Wheatbelt (DBCA, 2023). The application area sits within the Cocanarup salmon gum woodlands which represent the largest and most intact examples of old growth stands in the wider wheatbelt and agricultural area (DBCA, 2023). The woodlands of the Cocanarup region are unique in that they occupy hills and slopes, instead of the more common broad loamy flats. The salmon gum woodland unit has a restricted extent of occurrence as a result of historic clearing throughout the wheatbelt and may warrant consideration for listing as a PEC, having only been excluded from the equivalent federally listed 'Eucalypt woodlands of the Western Australian Wheatbelt' Threatened Ecological Community on the basis of geographic positioning on Interim Biogeographic Regionalisation of Australia boundaries alone (DBCA, 2023).

There were 17 weed species recorded within the survey area, two of which are recognised as Weeds of National Significance (**Lycium ferocissimum* and **Asparagus asparagoides*) and one of these two species (**A. asparagoides*) is also a Declared Pest (Biologic, 2022). Although the application area was deemed uninterpretable for dieback due to the limited indicator species (Tetris Environmental, 2022), it has been acknowledged that the application area is located in a known dieback risk area (Lindsay Bourke, personal communication, 22 February 2022; Brad Jakowyna, personal communication, 1 March 2022). Weeds and dieback have the potential to significantly change the dynamics of a natural ecosystem and lower the biodiversity of an area.

Fauna of the region is also likely to be significantly impacted by the proposed clearing. The proposed clearing is likely to lead to loss of habitat for several conservation significant fauna species of the region. The species likely to be impacted by the proposed clearing are Carnaby's black cockatoo, numbat, heath mouse, malleefowl, chuditch, and red-tailed phascogale (see section 3.2.2 for more detail).

Conclusion

Based on the above assessment, the proposed clearing is likely to result in impacts to the extent of the Cocanarup salmon gum woodland, habitat known to support Priority flora and critical habitat for fauna. Woodlands supply much needed cover to help stabilise and moderate the regional climate. The climate has become drier and more hostile due to a widespread loss of native plants. Keeping intact woodland vegetation helps to minimise serious salinity and erosion problems. It helps prevent salt pans from forming or spreading, and the loss of valuable topsoil from farmlands. Remaining woodlands provide vital habitat for many unique plants and animals. They include some that are now threatened, such as Carnaby's black cockatoo and the numbat.

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

Assessment

Several conservation significant fauna species have been recorded within the local area (10-kilometre radius of the application area) (see section C.4). The application area is located in the Cocanarup Timber Reserve (GIS Database), and it meets the criteria for what the EPA considers to be an area of high conservation significance which requires a high level of protection in Western Australia (EPA, 2008).

Carnaby's black cockatoo (EN)

The application area sits within the Cocanarup Timber Reserve, which is an important breeding area for Carnaby's cockatoo (DBCA, 2023; GIS Database). The application area is located within a confirmed breeding area for Carnaby's cockatoo (GIS Database). The area surrounding the proposed clearing meets the species criteria to rear young, in terms of proximity to food, water and hollows (DBCA, 2023). The Carnaby's cockatoo recovery plan (DPaW, 2013) summarises habitat critical to the survival for Carnaby's black cockatoos as:

- The eucalypt woodlands that provide nest hollows used for breeding, together with nearby vegetation that provides feeding, roosting, and watering habitat that supports successful breeding;
- Woodland sites known to have supported breeding in the past and which could be used in the future, provided adequate nearby food and/or water resources are available or are re-established; and
- In the non-breeding season, the vegetation that provides food resources as well as the sites for nearby watering and night roosting that enable the cockatoos to effectively utilise the available food resource.

The application area supports 73 trees with a diameter at breast height larger than 300 millimetres, of which, 24 contain hollows that could provide a nesting site for a black cockatoo (Bulletin Resources, 2023; Bulletin Resources, pers. comm, October 2023). The applicant has indicated that they will avoid trees with a diameter at breast height larger than 300 millimetres (Bulletin Resources, 2023). Surveys conducted by BirdLife Australia from 2018 until 2023 recorded 340 trees with active nests (black cockatoos being flushed from the hollow and/or nestlings or eggs observed) within 10 kilometres of the application area (BirdLife Australia, 2023). This makes the Cocanarup area one of the top three breeding sites for Carnaby's cockatoo in the whole State (BirdLife Australia, 2019). A visual representation of these trees can be found in Figure 8 of Appendix F.

Approximately 87% (525,732 ha) of potential Carnaby's cockatoo habitat has been cleared in the wheatbelt since European settlement (DPaW, 2013). The decline of black cockatoos has been due primarily to the loss and fragmentation of habitat as a

result of clearing native vegetation (DAWE, 2022). In the short term (decades), the loss or degradation of feeding habitat adjacent (less than 12 kilometres) to breeding sites is considered to pose the greatest risk to Carnaby's cockatoos (DPaW, 2013). Lack of foraging resources increases the likelihood that birds will not regain condition after breeding, will not breed again the following season, and that juveniles will not survive to become part of the adult population (DAWE, 2022). The removal of corridors of native vegetation that connect breeding and foraging sites in the wheatbelt region of Western Australia reduces the amount of food available for breeding birds, which will lead to a reduction in productivity and survival of young (DPaW, 2013). A further significant threat is the clearing, fragmentation and degradation of foraging and night roosting habitat in the non-breeding parts of Carnaby's cockatoo range in the south-west of Western Australia (DPaW, 2013). High quality foraging habitat in the area that surrounds nesting hollows is required for successful breeding. Carnaby's cockatoos rely on this proximity of foraging resources to known nesting trees to successfully raise chicks (DAWE, 2022). Foraging vegetation within 7 to 12 kilometres (species dependent) of a breeding site is important to adequately support breeding cockatoos (DAWE, 2022; DPaW, 2013). Management and increase of this feeding habitat that supports the breeding of Carnaby's cockatoo is a critical requirement for the conservation of the species (DPaW, 2013). The application area contains several primary foraging species for Carnaby's cockatoo including *Acacia saligna*, *Callitris* sp., *Eucalyptus occidentalis*, *Eucalyptus salmonophloia*, and *Hakea preissii*.

Given the proximity of known breeding trees, foraging habitat in the area that surrounds nesting hollows increases the chances for successful breeding. The proposed clearing of native vegetation will increase the risk of further decline in breeding success and population size, as breeding birds require a high quantity of food to be available during the breeding season (DPaW, 2013). Whilst further investigation is needed to confirm the number of trees actively being utilised by Carnaby's, based on the available information, the proposed disturbance represents a significant risk to an important population of Carnaby's cockatoo (DBCA, 2023).

Terrestrial Ecosystems (2023) assessed a project area of approximately 1.9 hectares in the Cocanarup Timber Reserve. This assessment was completed to quantify the amount of Carnaby's black cockatoo foraging habitat that would be impacted by clearing the proposed access track and associated exploration drill pads identified and flagged by Bulletin Resources. The proposed access track will impact approximately 0.64 hectares of Carnaby's black cockatoo foraging habitat. This habitat assessment did not cover the whole application permit boundary (22 hectares) and took a conservative approach to determine what was considered foraging habitat for Carnaby's black cockatoos (Terrestrial Ecosystems, 2023). The applicant informed the assessing officer that the conservative approach taken by the consultant means that every possible foraging species was recorded. However, the assessing officer does not consider this to be a conservative approach, rather an accurate representation of foraging species within the project area.

The loss of feeding habitat has been identified as a leading cause of the decline of Carnaby's cockatoo. 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). Given that there have been 340 trees previously recorded with active nest hollows within 10 kilometres of the application area and that the application area contains suitable foraging habitat, the native vegetation within the application area is considered critical for Carnaby's cockatoo. The impacts of the proposed clearing is considered highly significant given that the vegetation within the application area provides important foraging habitat to support breeding populations of Carnaby's black cockatoos. It is considered that the protection of existing important foraging habitat within Cocanarup that supports breeding populations to be critical.

Numbat (EN)

The application area contains significant stands of salmon gum (*Eucalyptus salmonophloia*), swamp yate (*E. occidentalis*) (Biologic, 2022; DPaW, 2017a). Salmon gum and yate provide plentiful hollow logs and support good termite populations (which numbats are almost completely dependent of for their diet) (DPaW, 2017a). Numbats were reintroduced in the Cocanarup Timber Reserve between 2006 and 2010 (Terrestrial Ecosystems, 2022). A sighting in 2013 confirms that animals survived the translocation and are still likely to be persisting in small numbers (DBCA, 2023) despite predation from cats, foxes, and birds of prey. The likelihood of occurrence of numbats in the area is considered possible and validation is required through targeted surveys (DBCA, 2023). The proposed clearing may reduce the suitability of the site and surrounding areas for future translocations as it will result in increased disturbance and predator access (DBCA, 2023). The level of survey completed for this species was not adequate to confirm species presence/absence and assess the significance of impacts. If numbats are present, impacts have the potential to be significant (DBCA, 2023). Actions that remove native vegetation can result in a significant impact on numbats, particularly if these actions remove habitat critical for survival or occur within the vicinity of habitat critical for survival (DPaW, 2017a). The application area is in an area considered to be critical habitat for Numbats (see Figure 3 in Appendix F).

Heath mouse (EN)

There are several historic and contemporary records of the heath mouse as recent as 2019 and as close as 3.4 kilometres (GIS Database). It should be noted that the Ravensthorpe area is considered the most likely place for the species to still exist (DBCA, 2023). The most likely cause of decline of the heath mouse in Western Australia is habitat loss as a result of clearing in the Wheatbelt (DCLM, 2002). The heath mouse is a fire sensitive species, preferring long unburnt (over 30 years) eucalyptus mallee over heath/sedge which is present at the site (DBCA, 2023) since the application area was last burnt in 1977 (GIS Database). In late spring and summer, their diet consists of flowers, seeds, and berries. At the end of summer, the species feeds on the stems, roots and leaves of grasses, sedges, and lilies. Following autumn rains, the species feeds on truffle-like fungi (TSSC, 2016). There has been widespread clearing of heath mouse habitat across the species' range. This clearing has resulted in extensive loss of habitat, as well as fragmentation and isolation of remaining habitat, thus limiting the potential for dispersal and genetic exchange (TSSC, 2016). Habitat loss is a threat across a moderate extent of the species' range, and this has severe to catastrophic consequences as the species cannot occur outside natural bush and requires large areas of vegetation (TSSC, 2016). The primary conservation actions indicated by the Threatened Species Scientific Committee (TSSC) in their Conservation Advice for the heath mouse (2016) are to prevent further loss and degradation of habitat and to maintain and increase habitat connectivity between subpopulations. The heath mouse is potentially present in the application area (Terrestrial Ecosystems, 2022). The level of survey

completed for this species is not adequate to confirm species presence/absence and assess the significance of impacts, however if present, impacts have the potential to be significant (DBCA, 2023).

Malleefowl (VU)

Three malleefowl mounds were recorded close (15 to 68 metres) to the application area (see Figure 6 in Appendix F). None of the identified mounds near the application area were active but they were in suitable condition that they could be used again (Terrestrial Ecosystems, 2022). Corridors of native vegetation that link remnants may greatly benefit malleefowl and enable populations to persist much longer by facilitating movement of animals between habitat patches (Benshemesh, 2007). Given that there are 227 historic and contemporary records within 20 kilometres of the application area, the area has the potential to be used for nesting, foraging and/or dispersal habitat (DBCA, 2023). Alteration through increased disturbance such as vehicle strike, mound disturbance, access by feral predators and potential introduction of dieback disease present a risk to the local population of malleefowl (DBCA, 2023). Given the presence of malleefowl mounds near the application area and suitable breeding habitat, the proposed clearing is likely to have a significant impact on malleefowl populations at the local scale (DBCA, 2023).

Chuditch (VU)

Chuditch require large areas of intact habitat to survive. Chuditch are rarely found where habitat is severely fragmented by clearing, except as transient animals. Loss and fragmentation of quality habitat for agriculture, residential and mining development has contributed significantly to the decline of chuditch populations in the south-west of Western Australia. Chuditch depend on the presence of den sites, protective cover, and sufficient prey biomass, all of which are typically removed by clearing (DEC, 2012a). Major threats to chuditch are listed as habitat alteration due to vegetation clearing, frequent fires and predation by foxes (Terrestrial Ecosystems, 2022). Actions that remove native vegetation (such as increased fire frequency, clearing for development, mineral exploration and extraction, and forestry) and suitable den logs and den sites from chuditch habitat can result in a significant impact on the chuditch (DEC, 2012a). Clearing is particularly deleterious where the affected land includes or adjoins riparian habitats, creates new gaps in otherwise homogeneous habitat, leads to progressive fragmentation of habitat, or requires the construction of roads (especially sealed roads) through, or adjacent to, uncleared habitat (DEC, 2012a). A tendency to return to previously visited locations has been observed in chuditch during relocation projects associated with land clearing (DBCA, 2023). Chuditch are possibly present in the application area (Terrestrial Ecosystems, 2022). Based on this and the large number of contemporary records, the impact is likely to be significant to the chuditch at the local scale (DBCA, 2023).

Red-tailed phascogale (CD)

Populations of red-tailed phascogale are currently known from several isolated nature reserves in the south-west of Western Australia, from the wheatbelt to the south coast, such as Tutanning, Boyagin, Dryandra, Dongolocking, and Parkeyerring, as well as remnant vegetation on private property. Red-tailed phascogales have also been recorded on the south coast near Ravensthorpe (DEC, 2012b). The red-tailed phascogale inhabits Wandoo (*Eucalyptus wandoo*) and Sheoak (*Allocasuarina huegeliana*) woodland associations, with populations being most dense in the latter vegetation type (DEC, 2012b). The red-tailed phascogale has been recently recorded (June 2023) in the Cocanarup area via field camera. This sighting was recorded 1.86 kilometres north of the application area (see Figure 7 of Appendix F) (Biddulph & Biddulph, 2023). Given that the red-tailed phascogale is a conservation dependent species, impacts from the proposed clearing are likely to be regionally significant for this species (DBCA, pers. comm., November 2023).

Western ringtail possum (CR)

Although there is a record of a western ringtail possum 0.3 kilometres from the application area (GIS Database), it is unlikely that this species occurs in the application area. The accuracy for this record being from a western ringtail possum is labelled as uncertain as it was based on a secondary sign (drey). The application area is not located within any of the known management zones for western ringtail possums (DPaW, 2017b). Additionally, the application area does not contain coastal heath, jarrah/marri woodland and forest, peppermint woodlands, myrtaceous heaths and shrublands, Bullich (*Eucalyptus megacarpa*) dominated riparian zones and karri forest, which is the habitat for western ringtail possum populations in the south coast (DPaW, 2017b). For this reason, the proposed clearing is unlikely have a significant impact on this species.

Other fauna

The impacts of the proposed clearing are unlikely to be significant for quenda (P4), western brush wallaby (P4), western whiplbird (P4), and western mouse (P4) (DBCA, 2023). It should be noted that Cocanarup Timber Reserve is likely to be under-surveyed when compared to surveys carried out within adjacent conservation estate, for example Fitzgerald National Park (DBCA, 2023). While the impacts from the proposed clearing are likely to be localised, increased access by feral predators and potential introduction of dieback disease all carry considerable risk to these threatened and priority fauna; increasing the likelihood of significance (DBCA, 2023). In the absence of survey data, the precautionary principle should be applied.

Ecological linkage

The Cocanarup Timber Reserve is an important ecological linkage for fauna in the region (DBCA, 2023; GIS Database). Although the proposed clearing is unlikely to sever the ecological linkage, it does have the potential to introduce weeds and dieback to the area which may impact the functionality of the linkage. This is discussed in further detail in section 3.2.3.

Conclusion

Based on the above assessment, the proposed clearing is likely to result in significant impacts to critical habitat for Carnaby's cockatoo and numbats and may result in significant impacts to habitats for heath mouse, malleefowl, chuditch, and red-tailed phascogale. The fauna species mentioned above can also be impacted directly by vehicle strikes during clearing.

3.2.3. Significant remnant vegetation – Clearing Principle (e)

Assessment

The application area is located in the Esperance Plains Interim Biogeographic Regionalisation for Australia (IBRA) bioregion. The full vegetation extent of the relevant areas for this application can be found in section C.2.

The remnant vegetation forms part of a significant ecological corridor in all directions providing key linkage to other areas of DBCA estate, including the Fitzgerald River National Park, the Ravensthorpe Range, and the Great Western Woodlands (DBCA, 2023). This corridor forms part of the Western Australian South Coast Macro Corridor Network (see Figure 4 in Appendix F). The main purpose for the South Coast Macro Corridor project was to identify a potential regional-scale Macro Corridor Network of native vegetation along Western Australia's southern coastline, with inland linkages along major river systems to protected areas and other uncleared bushland to enhance connectivity between existing protected areas in order to maintain regional biodiversity and ecosystem function (Wilkins et al., 2006). The South Coast Macro Corridor project designated the Fitzgerald River National Park as an area of Very High Conservation Value (contains ≥ 20 per cent of the total number of threatened fauna species present in the project area (≥ 5 species)). The Ravensthorpe Range was designated as an area of High Nature Conservation Value (contains 10-19 per cent of the total number of threatened fauna species present in the area (2-4 species) (Wilkins et al., 2006). The application area is also located within the Central Zone of the Gondwana Link Program (see Figure 11 in Appendix F). This zone extends from the Walpole Wilderness Area across the Stirling Range and Fitzgerald River national parks to the Ravensthorpe area. (Gondwana Link, 2024). Wherever possible, vegetation should be retained to maintain this linkage (DBCA, 2023).

Connectivity is fundamental to nature conservation because both plants and animals need to be able to move through landscapes. Within a landscape, habitat loss and fragmentation through land clearance is recognised as a major threat to the conservation of biodiversity (Wilkins et al., 2006). Because of its size and lack of fragmentation, the application area represents an area of consolidated habitat which is considered to be significant as a remnant of native vegetation.

Within the Macro Corridor Network area almost three million hectares (55%) of the original vegetation has been cleared (Wilkins et al., 2006). Despite vegetation association 352 having a native vegetation extent lower than 30 per cent, the local area (10-kilometre radius) still has a remaining pre-European vegetation extent of 72.2 per cent (GIS Database). Although the proposed clearing is 2.3 hectares, this clearing will result in secondary impacts such as increased erosion, altered hydrological regimes, and potential spread of dieback disease. Additionally, the introduction of long, linear clearing boundaries such as those proposed may alter the ecosystem function over time, increasing feral predator movement and the risk of weed incursion (DBCA, 2023).

Conclusion

Based on the above assessment, the proposed clearing is likely to result in impacts to a key ecological linkage and wildlife corridor as well as a significant remnant of native vegetation.

3.2.4. Conservation areas – Clearing Principle (h)

Assessment

The application area is located within the Cocanarup Timber Reserve (GIS Database). The application area is part of a 65,000-hectare area nominated to be listed as an 'A' Class reserve (CCA, 2022). The application area is also listed as a Schedule One area due to its status as a Redbook Recommended Conservation Reserve (GIS Database). The EPA Redbook Recommended Conservation Reserves contains the boundaries of areas recommended for conservation by the Environmental Protection Authority of Western Australia (DBCA, 2021). The application area is also located within an important ecological linkage that connects to the Fitzgerald National Park, the Ravensthorpe Range, and the Great Western Woodlands (DBCA, 2023). The area is known to be one of the three most important breeding sites for the Carnaby's Cockatoo (BirdLife Australia, 2019).

Given the application area is within the Cocanarup Timber Reserve, the proposed clearing will impact on the environmental values of this area through the increased degradation of adjoining vegetation, edge effects, loss of biodiversity, increased potential for the intrusion of weeds and dieback and through the decreased capacity for fauna dispersal.

Conclusion

Based on the above assessment, the proposed clearing is likely to impact on the conservation values of the Cocanarup Timber Reserve.

3.3. Relevant planning instruments and other matters

In considering a permit application, the Delegated Officer shall also have regard for any other relevant matter. 'Other matters' are not defined in the EP Act, and consequently are any matters the Delegated Officer considers relevant. Environmental impacts arising from a proposed land use is an 'other matter' that is considered relevant.

The clearing permit application was advertised on 24 May 2022 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. Fifty-two (52) submissions were received in relation to this application. Consideration of the matters raised in submissions is provided in Appendix B.

The permit area is within the South West Native Title Settlement area (DPLH, 2023). This settlement resolves Native Title rights and interests over an area of approximately 200,000 square kilometres within the southwest of Western Australia. 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, 2023). It is the applicant's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

Other relevant authorisations required for the proposed land use include:

- A Programme of Work approved under the *Mining Act 1978*.

It is the applicant'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.

The proposed clearing was referred to the Environmental Protection Authority (EPA) by a third party on 9 February 2023. The proposal was reviewed by the EPA and it was determined that while this proposal raises a number of environmental issues, the likelihood of significant effect is primarily associated with the clearing of native vegetation and consequential impacts to significant fauna from habitat loss. On 27 September 2023, the decision was made for the proposal not to be assessed under Part IV of the EP Act as is could be assessed under Part V Division 2 of the EP Act. This decision was not appealable (EPA, 2023).

It is noted that the proposed clearing may impact on Carnaby's black cockatoo, chuditch, heath mouse, numbat, malleefowl, and their habitats which are a protected matter under the EPBC Act. The applicant may be required to refer the project to the (Federal) Department of Climate Change, Energy, the Environment and Water (DCCEEW) for an environmental impact assessment under the EPBC Act. The applicant is advised to contact DCCEEW for further information regarding notification and referral responsibilities under the EPBC Act.

The Department of Biodiversity, Conservation and Attractions (DBCA) provided advice for the original proposal in March 2023. In their response to the letter of intention to refuse, the applicant raised concerns about the adequacy of the advice provided by DBCA to DEMIRS given that the advice provided by DBCA was based on the original proposal which involved a larger footprint (approximately 222 hectares) than the current proposal (approximately 22 hectares). On 27 March 2024, DBCA reviewed the advice provided for the original proposal and confirmed that their advice is still relevant for the revised proposal (DBCA, 2024).

The Delegated Officer recognises the targeted resource of the exploration project is lithium which forms part of the Green Energy Approvals Initiative to deliver faster environmental approvals for renewable energy projects. However, this initiative also highlights the importance of issuing these approvals without compromising the unique environmental biodiversity of Western Australia (Government of Western Australia, 2023).

4. Suitability of offsets

It is acknowledged that the applicant indicated a willingness to provide offsets, however, the Delegated Officer determined that due to the significant environmental impacts associated with the proposed clearing, an offset would not be suitable in counterbalancing these impacts in this particular area. This position aligns with the WA Environmental Offsets Guidelines, which state that offsets are not appropriate in all circumstances, as some environmental values cannot be offset.

End

Appendix A. Additional information provided by applicant

During the assessment, DEMIRS requested further information and an intent to refuse notification was issued to the applicant. The applicant has provided the requested information and comments on the department's notification which are summarised below.

| Summary of comments | Consideration of comment |
|--|---|
| On 29 June 2022, the department requested biological surveys to be conducted over the application area. | On 15 December 2022, the applicant provided a Targeted and Reconnaissance Flora and Vegetation Survey (Biologic, 2022) and a Basic Vertebrate Fauna Survey (Terrestrial Ecosystems, 2022). These surveys were used in the assessment of clearing principles (a), (b), (c), and (d). |
| On 12 October 2023, the applicant provided a new reduced clearing footprint along with a letter outlining the changes made to the proposal. | The environmental impacts of the new proposal were assessed against the 10 clearing principles. |
| On 29 November 2023, the applicant provided a memo from a foraging habitat inspection conducted by Terrestrial Ecosystems (2023). | This memo was taken into account when considering potential impacts to Carnaby's black cockatoo foraging and critical habitat, and addressed in section 3.2.2. |
| On 30 November 2023 a notice of intent to refuse was sent to the applicant. On 29 February 2024, the applicant provided a hydrological desktop survey (JDA, 2024) as part of a response to correspondence issued by DEMIRS. | This survey was used to aid in the assessment of clearing principles (f), (i) and (j). |
| On 29 February 2024 the applicant provided supporting documentation and an Exploration Environmental Management Plan (EEMP) as part of a response to correspondence issued by DEMIRS. | The supporting documentation provided (Talis, 2024) contained an assessment of the surveys conducted in the application area. The EEMP provided (Talis, 2023) provides information about the potential environmental impacts and the risk management techniques proposed by the applicant to avoid, minimise, or mitigate these impacts, and is addressed in section 3.1. |

Appendix B. Details of public submissions

| Summary of comments | Consideration of comment |
|---|---|
| Impacts to Carnaby's cockatoo and other fauna, vegetation communities, vegetation association 352, wildlife corridor, Threatened/Priority flora, watercourses, and TECs/PECs. | These impacts are addressed in the assessment against the clearing principles (see Appendix D). |
| Concerns regarding Aboriginal heritage sites, native title, and cultural heritage. | These matters are addressed in section 3.3. |
| Concerns about the lack of surveys of this application. | Surveys were requested by DEMIRS prior to commencing the assessment. The applicant provided Cocanarup Timber Reserve Targeted and Reconnaissance Flora and Vegetation Survey (Biologic, 2022), Basic Vertebrate Fauna Survey and Risk Assessment for the Cocanarup Timber Reserve (Terrestrial Ecosystems, 2022) and Carnaby's Black Cockatoo foraging habitat inspection for proposed track in Mining Tenement E74/655 (Terrestrial Ecosystems, 2023). |
| Concerns regarding indirect and cumulative impacts. | These impacts are addressed in section 3.2.3 |
| Concerns that the future of lithium is uncertain. | This is beyond the scope of this assessment as the assessment is made in accordance with Part V of the <i>Environmental Protection Act 1986</i> , however acknowledged in section 3.3. |

Appendix C. Site characteristics

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to the department at the time of this assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix D.

C.1. Site characteristics

| Characteristic | Details |
|------------------------|---|
| Local context | The area proposed to be cleared is part of an expansive tract of native vegetation in the intensive land use zone of Western Australia. It is surrounded by native vegetation and it is adjacent to the Phillips River. |
| Ecological linkage | The application area forms part of the Albany Macro Corridors Project (Wilkins et al., 2006; GIS Database). |
| Conservation areas | The application area is located within the Cocanarup Timber Reserve. The Cocanarup Timber Reserve and the surrounding Unallocated Crown Land make up one of the five priority areas for Threatened and Priority species and ecological communities management and recovery for the Fitzgerald Biosphere (DEC, 2012c). The application area is also surrounded by conservation areas 8.5 kilometres to the west (Koorngong Nature Reserve), 7.1 kilometres to the east (Unofficial – Department Interest), and 11 kilometres southwest (Fitzgerald River National Park) (GIS Database). |
| Vegetation description | <p>The vegetation of the application area is broadly mapped as the following Beard vegetation associations:</p> <p>352: Medium woodland; York gum; and 516: Shrublands; mallee scrub, black marlock (GIS Database).</p> <p>A flora and vegetation survey was conducted over the application area by Biologic Environmental Survey Pty Ltd during September, 2022. The following vegetation types were recorded within the application area (Biologic, 2022):</p> <p>AaDp: <i>Acacia acuminata</i> and <i>Dodonaea ptarmicifolia</i> tall closed shrubland over <i>Eremophila decipiens</i> subsp. <i>decipiens</i>, <i>Rhagodia crassifolia</i> and <i>Senna artemisioides</i> subsp. <i>filifolia</i> low sparse shrubland over <i>*Ursinia anthemoides</i> subsp. <i>anthemoides</i>, <i>Waitzia suaveolens</i> var. <i>flava</i> and <i>Cheilanthes sieberi</i> subsp. <i>sieberi</i> low sparse hermland on basalt, granite and pegmatite shallow brown clay loam soils on hillslopes and crests of undulating low hills.</p> <p>EbEcv: <i>Eucalyptus brachycalyx</i> and <i>Eucalyptus oleosa</i> subsp. <i>corvina</i> mid open mallee forest over <i>Templetonia retusa</i>, <i>Dodonaea ptarmicifolia</i> and <i>Santalum acuminatum</i> tall open shrubland over <i>Senna artemisioides</i> subsp. <i>filifolia</i> and <i>Acacia binata</i> mid sparse shrubland over <i>Eremophila decipiens</i> subsp. <i>decipiens</i>, <i>Olearia muelleri</i> and <i>Acacia erinacea</i> low sparse shrubland on basalt grey clay loam soils on slopes of undulating low hills.</p> <p>EcEce: <i>Eucalyptus cernua</i> and <i>Eucalyptus virella</i> mid open mallee woodland over <i>Acacia acuminata</i>, <i>Templetonia retusa</i> and <i>Dodonaea ptarmicifolia</i> tall shrubland over <i>Acacia binata</i> and <i>Daviesia nematophylla</i> mid sparse shrubland over <i>Phyllanthus calycinus</i> and <i>Senna artemisioides</i> subsp. <i>*artemisioides</i> low sparse shrubland over <i>Cheilanthes sieberi</i> subsp. <i>sieberi</i> and <i>Trachymene ornata</i> low hermland on basalt brown clay loam soils on lower slopes of undulating low hills.</p> <p>EeDp: <i>Eucalyptus extensa</i> mid closed mallee forest over <i>Dodonaea ptarmicifolia</i> and <i>Templetonia retusa</i> tall, isolated shrubs over <i>Enchylaena tomentosa</i> var. <i>tomentosa</i>, <i>Hydrocotyle rugulosa</i> and <i>*Lysimachia arvensis</i> low isolated herbs and forbs on basalt brown clay loam soils on upper slopes and hillcrests of undulating low hills.</p> <p>Ee: <i>Eucalyptus extensa</i> mid closed mallee forest over <i>Acacia binata</i> and <i>Daviesia nematophylla</i> tall open shrubland over <i>Enchylaena tomentosa</i> var. <i>tomentosa</i> and <i>Rhagodia preissii</i> subsp. <i>preissii</i> mid isolated shrubs over <i>Acacia erinacea</i>, <i>Acacia glaucoptera</i> and <i>Senna artemisioides</i> subsp. <i>*artemisioides</i> low sparse shrubland on basalt, granite, and pegmatite brown clay loam soils on slopes of undulating low hills.</p> <p>EeEcv: <i>Eucalyptus extensa</i> and <i>Eucalyptus virella</i> mid open mallee forest over <i>Acacia acuminata</i>, <i>Dodonaea ptarmicifolia</i> and <i>Templetonia retusa</i> tall open shrubland over <i>Acacia glaucoptera</i> and <i>Daviesia nematophylla</i> mid sparse shrubland over <i>Lepidosperma diurnum</i> low isolated sedges over <i>Waitzia suaveolens</i> var. <i>flava</i>, <i>Hydrocotyle rugulosa</i> and <i>*Lysimachia arvensis</i> low isolated herbs on quartz and basalt brown clay loam soils on upper slopes and hillcrests of undulating low hills.</p> <p>Eo: <i>Eucalyptus occidentalis</i> mid open woodland over <i>Melaleuca viminea</i> subsp. <i>viminea</i>, <i>Melaleuca cuticularis</i>, <i>Callitris roei</i> and <i>Callistemon phoeniceus</i> tall shrubland over <i>Gahnia ancistrophylla</i> tall sparse sedgeland over <i>Tecticornia halocnemoides</i> low isolated samphire shrubs over low mixed weedy grasses and herbs on mixed stones with granite outcropping surrounding on black and brown sandy clay loam in minor creeklines.</p> |

| Characteristic | Details |
|------------------------|---|
| | <p>Eoc: <i>Eucalyptus oleosa</i> subsp. <i>corvina</i> mid mallee woodland over <i>Daviesia nematophylla</i>, <i>Templetonia retusa</i> and <i>Santalum acuminatum</i> tall open shrubland over <i>Rhagodia preissii</i> and <i>Senna artemisioides</i> subsp. <i>xartemisioides</i> mid isolated shrubs over <i>Acacia glaucoptera</i> and <i>Sclerolaena diacantha</i> low sparse shrubland on quartz and basalt brown clay loam soils on slopes undulating low hills.</p> <p>EsEbAa: <i>Eucalyptus salmonophloia</i> mid woodland over <i>Eucalyptus brachycalyx</i> mid open mallee woodland over <i>Acacia acuminata</i> and <i>Alyxia buxifolia</i> tall shrubland over <i>Daviesia nematophylla</i>, <i>Dodonaea ptarmicifolia</i> and <i>Acacia binata</i> tall open shrubland over <i>Eremophila decipiens</i> subsp. <i>decipiens</i>, <i>Grevillea oligantha</i> and <i>Olearia muelleri</i> low open shrubland over <i>Waitzia suaveolens</i> var. <i>flava</i> and <i>Cheilanthes sieberi</i> subsp. <i>sieberi</i> low sparse herbland on basalt brown clay loam soils on slopes of undulating low hills.</p> <p>EsEb: <i>Eucalyptus salmonophloia</i> mid woodland over <i>Eucalyptus brachycalyx</i> mid isolated mallee trees over <i>Acacia binata</i> and <i>Senna artemisioides</i> subsp. <i>filifolia</i> mid shrubland over <i>Eremophila decipiens</i> subsp. <i>decipiens</i>, <i>Olearia muelleri</i>, <i>Rhagodia crassifolia</i> and <i>Acacia erinacea</i> low open shrubland on basalt brown clay loam soils on flats, valley slopes and lower slopes of undulating low hills.</p> <p>MvMhMi: <i>Melaleuca viminea</i>, <i>Melaleuca hamulosa</i> and <i>Melaleuca incana</i> subsp. <i>incana</i> tall sparse shrubland over <i>*Lycium ferocissimum</i>, <i>Acacia patagia</i> and <i>Acacia cyclops</i> mid sparse shrubland over <i>Gahnia ancistrophylla</i> tall sparse sedgeland over <i>Tecticornia indica</i> subsp. <i>bidens</i>, <i>Disphyma crassifolium</i> and <i>*Lysimachia arvensis</i> mixed sparse herbland and forbland on sandy soils with mixed stones and boulders (mainly basalt and granite) with exposed granite outcropping associated with Phillips River.</p> |
| Vegetation condition | <p>The vegetation survey (Biologic, 2022) and aerial imagery indicate the vegetation within the proposed clearing area is in Excellent to Very Good (Keighery, 1994) condition.</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix E. Mapping of vegetation types and vegetation condition are available in Appendix F.</p> |
| Climate and landform | The application area is located in a winter zone characterised by wet winters and low summer rainfall with an annual average rainfall of 429 millimetres (BoM, 2022). |
| Soil description | The soil within the application area is mapped as soil unit Va67 (GIS Database). This soil unit is described as undulating to hilly ridge and slope topography with flat to gently sloping crests to the ridges; rock outcrops are common on slopes: chief soils are hard alkaline yellow mottled and red mottled soils on the valley side slopes (Northcote et al. 1960-68). |
| Land systems | The application area falls within the Ravensthorpe system and the Kybulup system (DPIRD, 2023). The Ravensthorpe land system is described as undulating low hills on Archean greenstone of metasediments and ultramafics in the Ravensthorpe Zone, with alkaline red shallow loamy duplex, shallow gravel and self-mulching cracking clay, non-cracking clay, and stony soil. Salmon gum and York gum are present (DPIRD, 2023). The Kybulup land system is described as undulating low hills and rises on weathered granite and gneiss, in the Ravensthorpe Zone, with alkaline shallow loamy duplex (red and grey), grey shallow sandy duplex and non-cracking clay. Mallee scrub is present (DPIRD, 2023). |
| Waterbodies | The desktop assessment and aerial imagery indicated that several minor, non-perennial watercourses transect the area proposed to be cleared (GIS Database). Additionally, the application area is adjacent to the Phillips River (GIS Database). |
| Hydrogeography | The application area is located within the Arrowsmith Groundwater Area which is legislated by the RIWI Act 1914 (GIS Database). The groundwater salinity within the application area varies between 500-1,000 milligrams per litre total dissolved solids which is described as marginal to 1,000-3,000 milligrams per litre total dissolved solids which is described as brackish to saline (GIS Database). |
| Flora | There are records of one Priority flora species within the application area (Biologic, 2022). There are other flora species within the application area that are considered significant for reasons other than listing as a Threatened or Priority flora (Biologic, 2022). |
| Ecological communities | The Priority 3 Ecological Community 'Proteaceae Dominated Kwongan Shrublands' is mapped over the application area (GIS Database). However, the review of the key diagnostic features indicated that the vegetation in the application area is not represented of the PEC (Biologic, 2022). |
| Fauna | Carnaby's black cockatoo were recorded foraging in the survey area and three inactive malleefowl mounds were recorded close to the application area (Terrestrial Ecosystems, 2022). There are other conservation significant species that are likely to occur within the application area (see section C.4) |

C.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 - Esperance Plains | 2,899,941 | 1,494,450 | ~ 52 | 822,666 | ~ 28 |
| IBRA Subregion - Fitzgerald | 1,570,678 | 865,779 | ~ 55 | 438,848 | ~ 28 |
| Local Government – Ravensthorpe | 982,194 | 605,475 | ~ 62 | 193,141 | ~ 20 |
| Beard vegetation associations - State | | | | | |
| 352 | 724,269 | 142,012 | ~ 20 | 12,673 | ~2 |
| 516 | 607,434 | 332,849 | ~ 55 | 146,939 | ~ 24 |
| Beard vegetation associations - Bioregion | | | | | |
| 352 | 22,817 | 6,566 | ~ 29 | 22 | ~ .1 |
| 516 | 318,747 | 219,798 | ~ 69 | 91,556 | ~ 29 |
| Beard vegetation associations - subregion | | | | | |
| 352 | 22,817 | 6,566 | ~ 29 | 22 | ~ .1 |
| 516 | 219,038 | 183,114 | ~ 84 | 84,184 | ~ 38 |

Government of Western Australia (2019).

C.3. Flora analysis table

The table below shows the results of the desktop survey undertaken by Biologic (2022). Only the flora found within 20 kilometres of the application area were included in the table below.

| Taxon | Conservation Status | | | Habit and Habitat | Habitat within Study Area | Within Current Known Distribution | Distance to Nearest Known Record | Assessment of Occurrence | |
|---|---------------------|--------|----------|---|---------------------------|-----------------------------------|----------------------------------|--------------------------|-----------------|
| | DBCA | BC Act | EPBC Act | | | | | Pre-Survey | Post-Survey |
| <i>Acacia bifaria</i> | P3 | | | Prostrate or semi-prostrate, commonly domed shrub, 0.3-0.6(-0.8) m high, to 2 m wide. Fl. yellow, Aug to Oct or Dec. Clay, rocky loam, sandy soils. Undulating plains, roadsides, low-lying areas. | Yes | Yes | 0.5 km N | Highly Likely | Possible |
| <i>Austrostipa turbinata</i> | P3 | | | Perennial tussock grass to 0.4 m tall. Fl. Sep-Oct. Rocky loam over laterite, sandy loam/sandy clay, cracking clays, quartz/basalt/greenstone/calcrete. Hills, flats, granite dome, gilgai. | Yes | Yes | 0.1 km S | Highly Likely | Possible |
| <i>Notisia intonsa</i> | P3 | | | Prostrate to ascending annual, herb, 0.01-0.04 m high. Fl. yellow-brown, Sep to Oct. Red/brown clay, stony saline loam. Plains, dampplains, floodplains, gentle slopes. | Yes | Yes | 0.5 km S | Highly Likely | Possible |
| <i>Acacia besleyi</i> | P1 | | | Upright rounded shrub up to 3 m tall. Fl. bright yellow, Sept. Clay loam, rocky loam, granite, quartz. Slopes, creeklines, gully, Eucalyptus woodland, mallee scrub. | Yes | Yes | 2.5 km E | Likely | Possible |
| <i>Cassinia arcuata</i> | P2 | | | Erect multi-stemmed aromatic (like honey) shrub, to 2 m high. Fl. brown, mainly Jan to Apr. Loam, clay loam. Ridge, adjacent to creeklines, slopes, flats. | Yes | Yes | 0.9 km NNW | Likely | Possible |
| <i>Levenhookia pulcherrima</i> | P3 | | | Annual (likely fire ephemeral), herb, 0.03-0.7 m high. Fl. pink-red, Oct to Nov. Sand, loam, clayey sand, granite/quartz/lateite. Slopes, plains. | Yes | Yes | 1.2 km N | Likely | Possible |
| <i>Eucalyptus desmondensis</i> | P4 | | | Mallee (slender, willow), 1-4.5 m high, bark smooth. Fl. yellow, Jan to Jun or Aug to Dec. Stony loam or sand, clay, granitic soils. Rocky hillsides, sandplains. | Yes | Yes | 1.2 km N | Likely | Possible |
| <i>Melaleuca penicula</i> | P4 | | | Spreading shrub, 1.8-3 m high, leaf blade narrowly ovate, 2.7-3.8 times as long as wide. Fl. red, Jan to Feb. Red/brown loamy sand or red sandy clay. Granite outcrops, valley slopes. | Yes | Yes | 2.2 km W | Likely | Possible |
| <i>Eremophila denticulata</i> subsp. <i>denticulata</i> | T | VU | VU | Erect, open shrub, 0.5-2.5 m high. Fl. pink-orange/yellow-orange-red, Aug to Dec or Jan to Feb. Alluvium, sand, sandy clay loam. River beds & plains, laterite breakaways. | Possible | Yes | 8.5 km SSE | Possible | Unlikely |
| <i>Grevillea maxwellii</i> | T | CR | EN | Prostrate to spreading shrub, 0.2-1.2 m high, up to 2 m wide. Fl. red, May or Aug to Sep. Sandy clay or clay loam over granite. Hilltop. | Yes | No | 4.5 km S | Possible | Unlikely |
| <i>Verticordia helichrysantha</i> | T | VU | VU | Spreading shrub, 0.1-0.3(-0.6) m high. Fl. green-yellow, May or Jul to Nov. Sandy soils over spongillite. Coastal plains & cliffs. | Yes | No | 4.6 km S | Possible | Unlikely |
| <i>Grevillea sulcata</i> | P1 | | | Spreading or upright bushy shrub, ca 0.3 m high (up to 0.65 m). Fl. red, Apr-Jul. Clay loam, quartz, greenstone, granite or laterite. Gentle slopes. | Yes | Adjacent | 3.9 km NNE | Possible | Unlikely |
| <i>Lepidosperma</i> sp. Mt Chester (S. Kem et al. LCH 16596) | P1 | | | Caespitose sedge to 0.4 m tall, compressed culms. Fl. grey-brown, Sept-Nov. Clay loam, ironstone, sandstone, quartz. Slopes, undulating plains, slightly rocky outcrops, hillcrests. | Possible | Yes | 5.3 km SW | Possible | Confirmed |
| <i>Lepidosperma</i> sp. Mt Short (S. Kem et al. LCH 17510) | P1 | | | Sedge to 0.5 m tall. Fl. Oct-Nov. Shallow loamy sand, quartz, ironstone, laterite. Slopes, hillcrests, slight rock outcropping. | Yes | Yes | 7.1 km SW | Possible | Confirmed |
| <i>Austrostipa heteranthera</i> | P2 | | | Grass to 0.5 m tall. Fl. Oct-Nov. Shallow sandy clay loam, greenstone/granite/calcrete/quartz. Gently slopes and crests. Shrub or tree mallee. | Possible | Yes | 1.3 km W | Possible | Unlikely |
| <i>Boronia denticulata</i> subsp. <i>whoogarupensis</i> | P2 | | | Slender upright shrub to 1.5 m. Fl. pink, Apr, Aug, Nov-Dec. Loamy sand. Creekline. | Possible | Adjacent | 4.4 km NW | Possible | Unlikely |
| <i>Grevillea nivea</i> | P2 | | | Bushy shrub to 1.5m. Fl. red, Nov. Coarse sand over granite. Slopes. Heath. | Yes | No | 4.5 km S | Possible | Unlikely |
| <i>Acacia errabunda</i> | P3 | | | Dense, bushy, spreading shrub, 1-2.5 m high. Fl. yellow, Aug, Clay, loam, gravelly loam, sand. Undulating plains, clay flats. | Possible | Yes | 9.5 km E | Possible | Unlikely |
| <i>Daviesia newheyi</i> | P3 | | | Bushy, multi-stemmed, broom-like shrub, 0.25-1.5 m high. Fl. orange/yellow & red, Aug to Oct. Sand or sandy clay over granite. Rocky slopes. | Yes | Yes | 4.7 km NW | Possible | Unlikely |
| <i>Gastrolobium stenophyllum</i> | P3 | | | Bushy, erect shrub, to 3 m high. Fl. orange/pink/red, Sep to Dec or Jan to Feb. Sandy soils over granite. Base of rock outcrops, along rivers, in woodland, shrubland or heath. | Possible | Yes | 7.3 km N | Possible | Unlikely |
| <i>Grevillea punctata</i> | P3 | | | Upright shrub, 0.5-2 m high. Fl. red, Apr to May or Nov. Stony red loam, red clay, greenstone, rocky soils. Undulating hills. | Yes | Yes | 5 km SSW | Possible | Unlikely |
| <i>Lepidosperma</i> sp. Shoemaker Levy (L. Ang & O. Davies 10815) | P3 | | | Tufted sedge to 0.35 m tall, stems compressed. Fl. Oct-Nov. Sandy clay, loamy sand. Gentle slopes with minor outcropping (ironstone, greenstone, quartz). | Possible | Adjacent | 7.1 km SW | Possible | Unlikely |
| <i>Spyridium mucronatum</i> subsp. <i>recurvum</i> | P3 | | | Erect or spreading shrub, 0.15-0.6 m high. Fl. white-cream-yellow, Oct to Nov. Sandy & clayey soils. Plains. | Yes | Yes | 2.9 km S | Possible | Unlikely |
| <i>Grevillea fastigiata</i> | P4 | | | Upright single-stemmed shrub, 0.9-2 m high. Fl. red, Sep-Oct, Jan, May. Red clay, granite. Slopes. | Yes | Adjacent | 1.2 km N | Possible | Unlikely |
| <i>Guichenotia apetala</i> | P1 | | | Compact, much-branched shrub, 0.15-0.4 m high. Fl. blue-pink/pink, May or Sep to Dec. Gravel, laterite. | Possible | No | 9.4 km WSW | Unlikely | Highly Unlikely |
| <i>Dampiera sericantha</i> | P3 | | | Erect, slender perennial, herb, 0.05-0.3(-0.6) m high, stems with blunt angles. Fl. blue, May or Aug to Dec. Sand, sometimes with gravel. Plains. | Possible | Adjacent | 9 km NE | Unlikely | Highly Unlikely |
| <i>Gonocarpus trichostachyus</i> | P3 | | | Erect to spreading perennial, herb, 0.05-0.17 m high. Fl. red-purple, Sep to Oct. Sandy soils over granite, clay-loam, gravelly. Slopes, flats, granite crevices. | Possible | Adjacent | 5.7 km W | Unlikely | Highly Unlikely |
| <i>Pultenaea indira</i> subsp. <i>monstrosta</i> | P3 | | | Procumbent or erect, sparse or bushy shrub, 0.1-0.6 m high. Fl. orange/red, yellow and black, Sep-Oct. Sand, sandy clay or loamy sand, gravel. Gentle slopes, flat to undulating plains, adjacent to salt lake. | Yes | No | 6.3 km W | Unlikely | Highly Unlikely |

Additionally, through a search of available databases, two more species were identified as occurring within 10 kilometres of the application area (GIS Database).

| Species name | Conservation status | Suitable habitat features? [Y/N] | Distance of closest record to application area (km) | Number of known records (total) | Are surveys adequate to identify? [Y, N, N/A] | Assessment of Occurrence Pre-survey | Assessment of Occurrence Post-survey |
|-----------------------------|---------------------|----------------------------------|---|---------------------------------|---|-------------------------------------|--------------------------------------|
| <i>Chorizema ulotropis</i> | P4 | Y | 7 km | 25 | Y | Unlikely | Highly unlikely |
| <i>Goodenia phillipsiae</i> | P4 | Y | 9.9 km | 36 | Y | Unlikely | Highly unlikely |

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

C.4. Fauna analysis table

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

| Species name | Conservation status | Suitable habitat features? [Y/N] | Suitable vegetation type? [Y/N] | Distance of closest record to application area (km) | Are surveys adequate to identify? [Y, N, N/A] |
|------------------------------------|---------------------|----------------------------------|---------------------------------|---|---|
| Western ringtail possum | CR | N | N | 0.3 km | N |
| Carnaby's black cockatoo | EN | Y | Y | 0 km | Y |
| Heath mouse | EN | Y | Y | 3.4 km | N |
| Numbat | EN | Y | Y | 1.9 km | N |
| Chuditch | VU | Y | Y | 0.3 km | N |
| Malleefowl | VU | Y | Y | 0.2 km | Y |
| Western whiplbird (western mallee) | P4 | Y | Y | 1.1 km | N |
| Western mouse | P4 | Y | Y | 9.7 km | N |
| Western brush wallaby | P4 | Y | Y | 0.2 km | N |
| Quenda | P4 | Y | Y | 0.2 km | N |
| Red-tailed phascogale | CD | Y | Y | 1.8 km | N |

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

(Terrestrial Ecosystems, 2022; GIS Database)

C.5. Ecological community analysis table

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

| Community name | Conservation status | Suitable habitat features? [Y/N] | Suitable vegetation type? [Y/N] | Suitable soil type? [Y/N] | Distance of closest record to application area (km) | Are surveys adequate to identify? [Y, N, N/A] |
|--|---------------------|----------------------------------|---------------------------------|---------------------------|---|---|
| Proteaceae Dominated Kwongan Shrubland | P3 | Y | N | Y | 0 km | Y |

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

(GIS Database)

C.6. Land degradation risk table

| Risk categories | Land Unit 1 |
|--------------------------|---|
| Wind erosion | M2: 40-75% of the map unit has a high to extreme hazard |
| Water erosion | L1: 2-3% of the map unit has a very high to extreme hazard |
| Salinity | L1: 0-5% of the map unit has a moderate or high hazard or is presently saline |
| Subsurface Acidification | M2: 40-75% of the map unit has a high susceptibility or is presently acidic |
| Flood risk | L1: 0% of the map unit has a moderate to high hazard |
| Water logging | L1: 0% of the map unit has a moderate to very high to risk |
| Phosphorus export risk | L2: 9% of the map unit has a high to extreme hazard |

(DPIRD, 2023)

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Appendix D. Assessment against the clearing principles

| Assessment against the clearing principles | Variance level | Is further consideration required? |
|--|------------------------------|--|
| Environmental value: biological values | | |
| <p>Principle (a): <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>The south-west of Western Australia is known as one of the world’s 34 biodiversity ‘hotspots’, with some of the richest and most unique reservoirs of plant and animal life on earth (DBCA, 2022).</p> <p>The area proposed to be cleared contains Threatened fauna and Priority flora (Biologic, 2022; Terrestrial Ecosystems, 2022). A portion of the application area is mapped as the Priority 3 ‘Proteaceae Dominated Kwongkan Shrublands’ Ecological Community (GIS Database).</p> | At variance | Yes <i>Refer to Section 3.2.1, above.</i> |
| <p>Principle (b): <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 is located in the Cocanarup Timber Reserve which contains critical foraging and breeding habitat for Carnaby’s cockatoo (Terrestrial Ecosystems, 2022). The applicant has committed to avoiding all breeding habitat for Carnaby’s cockatoo. The application area also contains breeding habitat for malleefowl (Terrestrial Ecosystems, 2022). Other conservation significant species (listed in section C.4) are likely to occur within the application area because the habitat for these species is present and there are records of these species within 10 kilometres of the application area (Terrestrial Ecosystems, 2022; GIS Database). Additionally, the application area forms part of a large wildlife corridor, effectively connecting three vast natural areas: the Fitzgerald National Park, the Ravensthorpe Range, and the Great Western Woodlands (DBCA, 2023).</p> | At variance | Yes <i>Refer to Section 3.2.2, above.</i> |
| <p>Principle (c): <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 records of Threatened flora within the area proposed to be cleared (Biologic, 2022; GIS Database).</p> | Not likely to be at variance | No |
| <p>Principle (d): <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared does not form part of a known or mapped Threatened Ecological Community (Biologic, 2022; GIS Database).</p> | Not likely to be at variance | No |
| Environmental value: significant remnant vegetation and conservation areas | | |
| <p>Principle (e): <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 full vegetation extent of the relevant areas for this application can be found in section C.2. Some of the vegetation extents fall below the recommended 30 per cent threshold of pre-European settlement levels of native vegetation (Commonwealth of Australia, 2001). The application area functions as an important ecological linkage that connects to the Fitzgerald National Park, the Ravensthorpe Range, and the Great Western Woodlands (DBCA, 2023) and forms part of the Western Australian South Coast Macro Corridor Network (Wilkins et al., 2006). The presence of important foraging habitat for a number of conservation significant fauna species and habitat for priority flora indicates the application area is significant as a remnant of native vegetation.</p> | At variance | Yes <i>Refer to Section 3.2.3, above</i> |

| Assessment against the clearing principles | Variance level | Is further consideration required? |
|---|------------------------------|---|
| <p><u>Principle (h):</u> “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.”</p> <p><u>Assessment:</u></p> <p>The application area is located close to various environmental values of conservation areas nearby. The proposed clearing may have an impact on the environmental values of adjacent or nearby conservation areas.</p> | At variance | Yes <i>Refer to Section 3.2.4, above</i> |
| Environmental value: land and water resources | | |
| <p><u>Principle (f):</u> “Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</p> <p><u>Assessment:</u></p> <p>There are five minor ephemeral creeks that intersect the application area (GIS Database). The proposed clearing is likely to impact vegetation growing in association with a watercourse.</p> | At variance | No |
| <p><u>Principle (g):</u> “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</p> <p><u>Assessment:</u></p> <p>The mapped soils within the application area are moderately susceptible to wind erosion (DPIRD, 2023). Additionally, cut and fill track development has the potential to introduce significant erosion problems (DBCA, 2023). Noting the location of the application area and the condition of the vegetation, the proposed clearing is likely to have an appreciable impact on land degradation.</p> | At variance | No |
| <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>There are no permanent water courses, wetlands, or Public Drinking Water Source Areas within the application area, the Phillips River is adjacent to a portion of the application area (GIS Database). The tributary crossing the application area is ephemeral and located in rock bed material, no erosion and deposition is expected to occur (JDA, 2024). The proposed clearing is unlikely cause deterioration in the quality of surface or underground water</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>JDA (2024) concludes that there will not be damming and sediment flow issues that alter the flow and sediment transport in Phillips River by this project, if carried out when there is no flow in the creek. The proposed clearing will not result in altered hydrology of Phillips River and will not alter the incidence or intensity of flooding during heavy rains (JDA, 2024).</p> | Not likely to be at variance | No |

Appendix E. 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. |

| Condition | Description |
|---------------------|--|
| 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 F. Mapping of various features in the application area

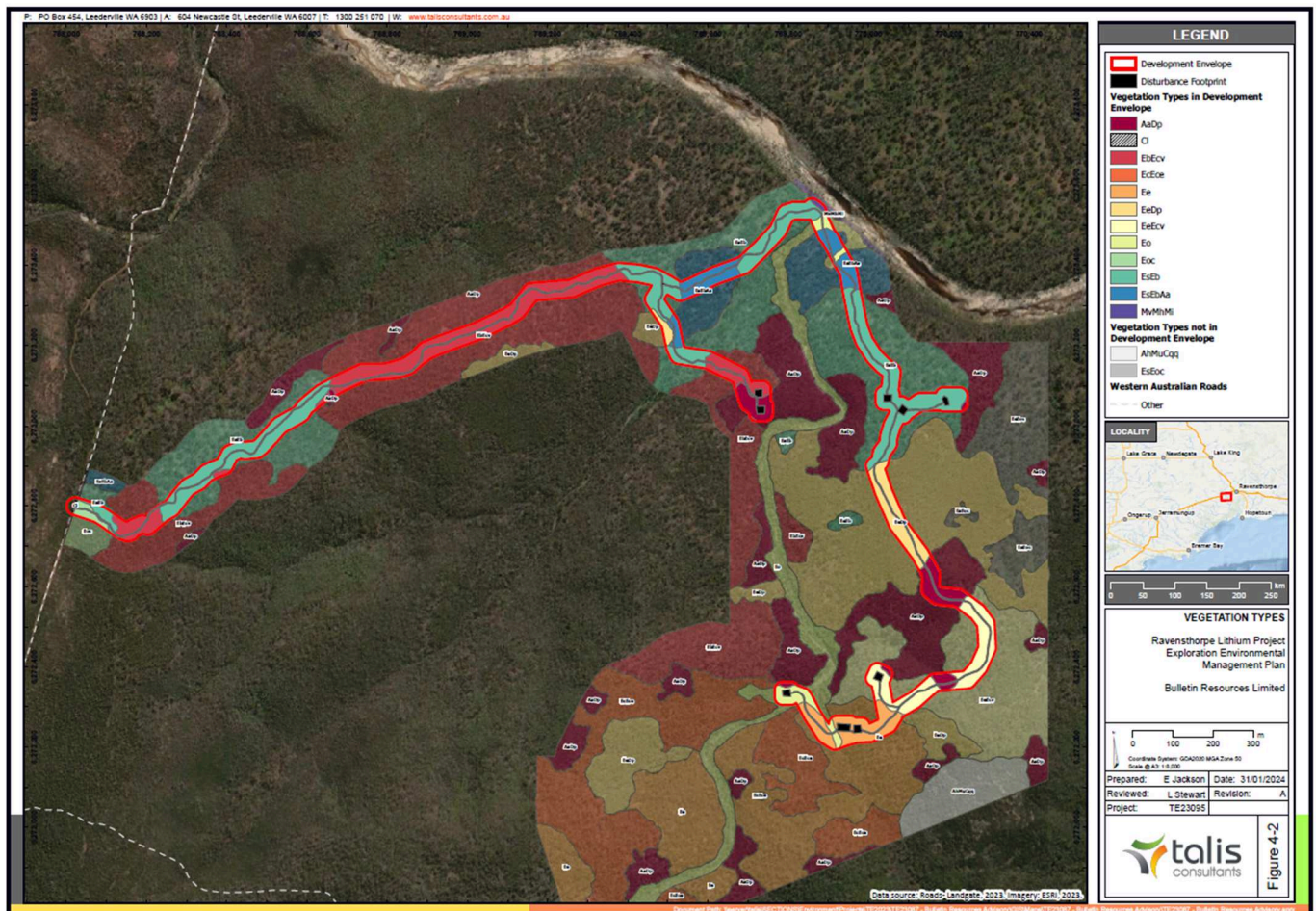


Figure 1. Map of vegetation types (Talis, 2024).

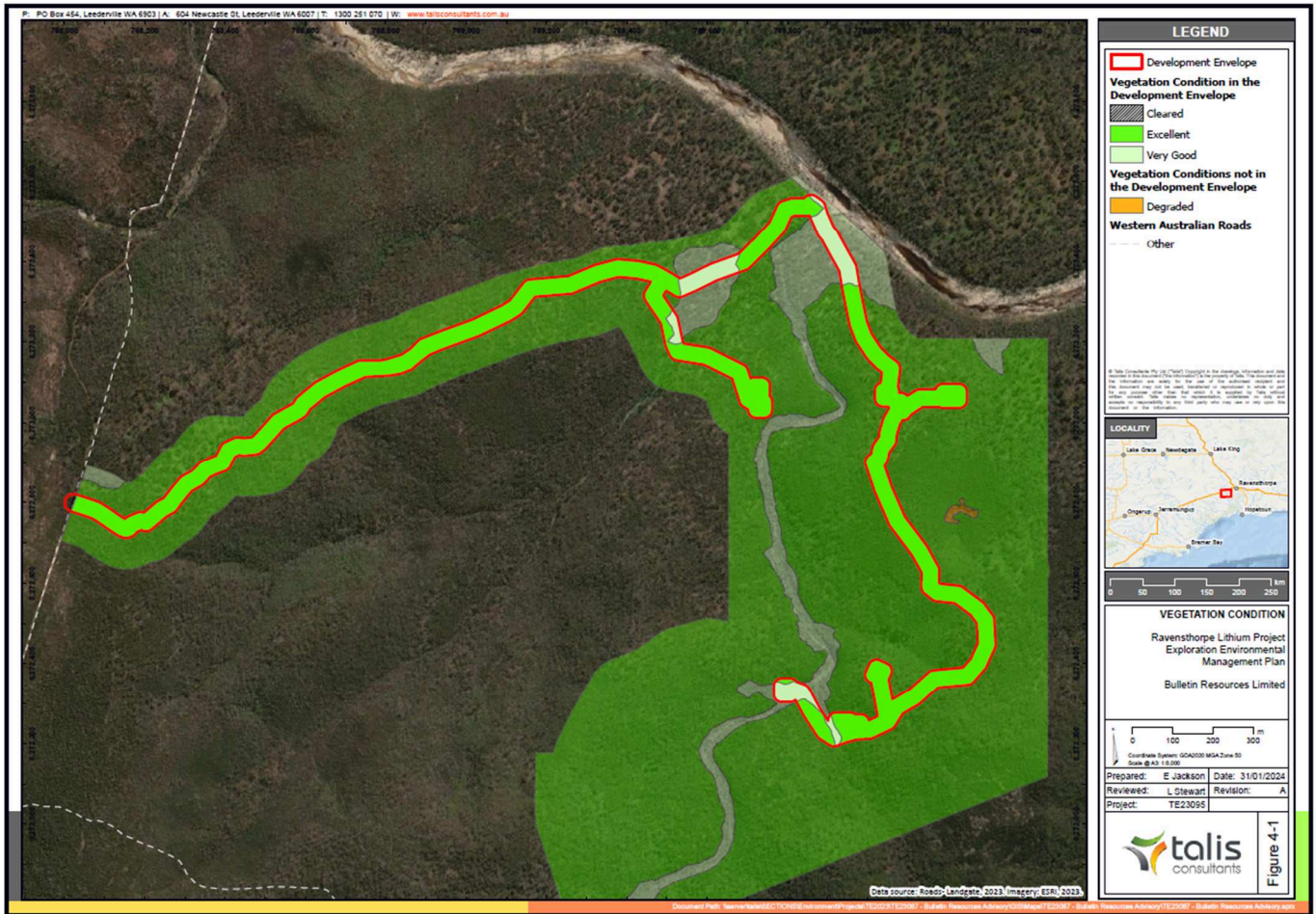


Figure 2. Map of vegetation condition (Talis, 2024).

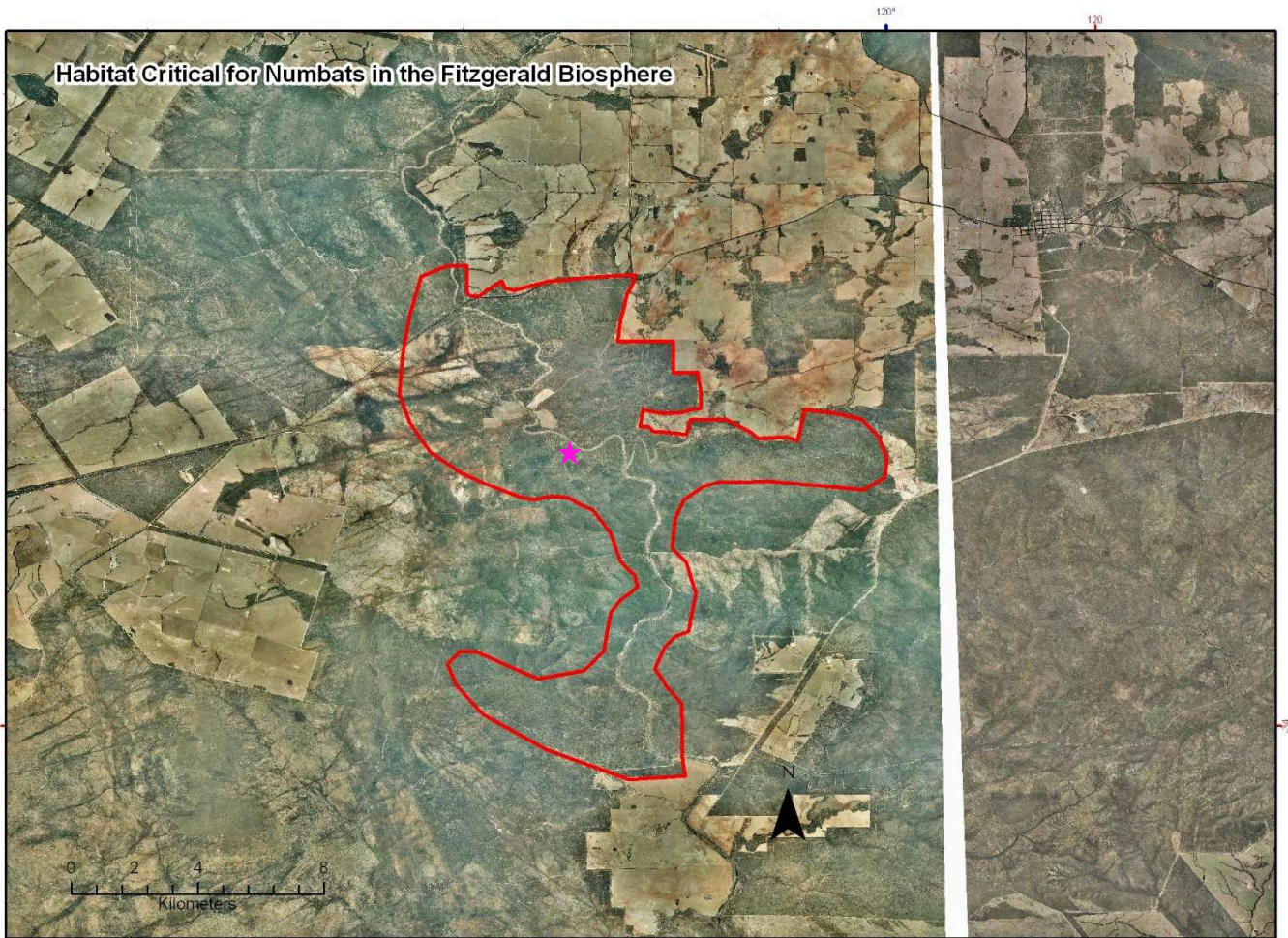


Figure 3. Mapping of critical habitat for Numbats in the Fitzgerald Biosphere (DBCA, *pers. comm.*, January 2017). The pink star shows the approximate location of the application area.

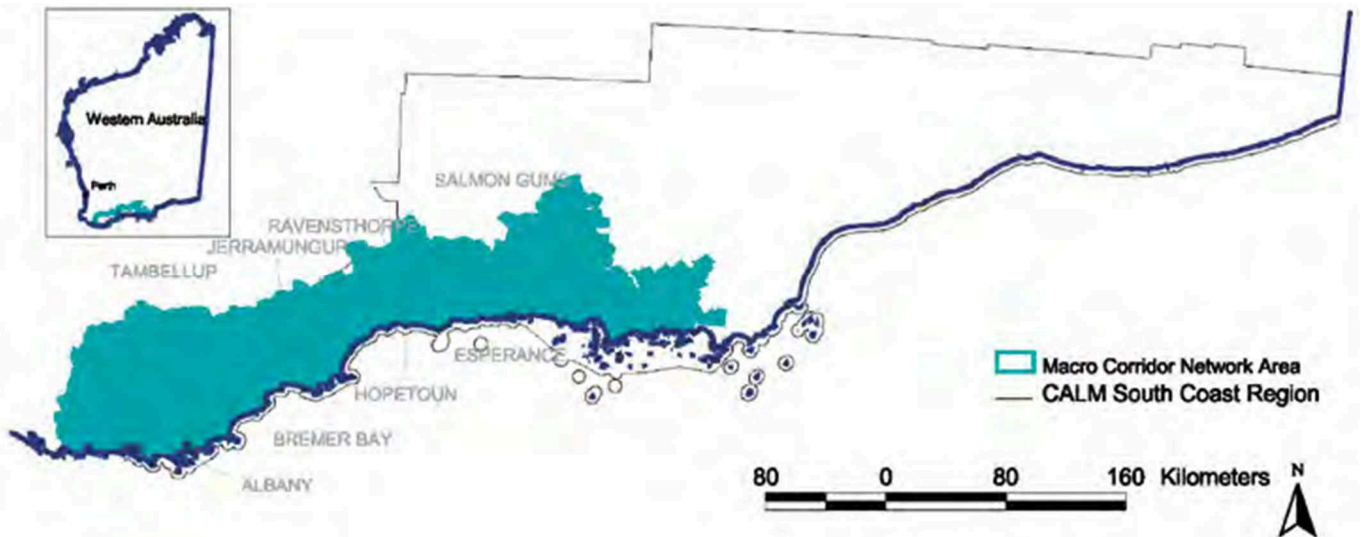


Figure 4. Mapping of the Western Australian South Coast Macro Corridor Network area (Wilkins et al., 2006).

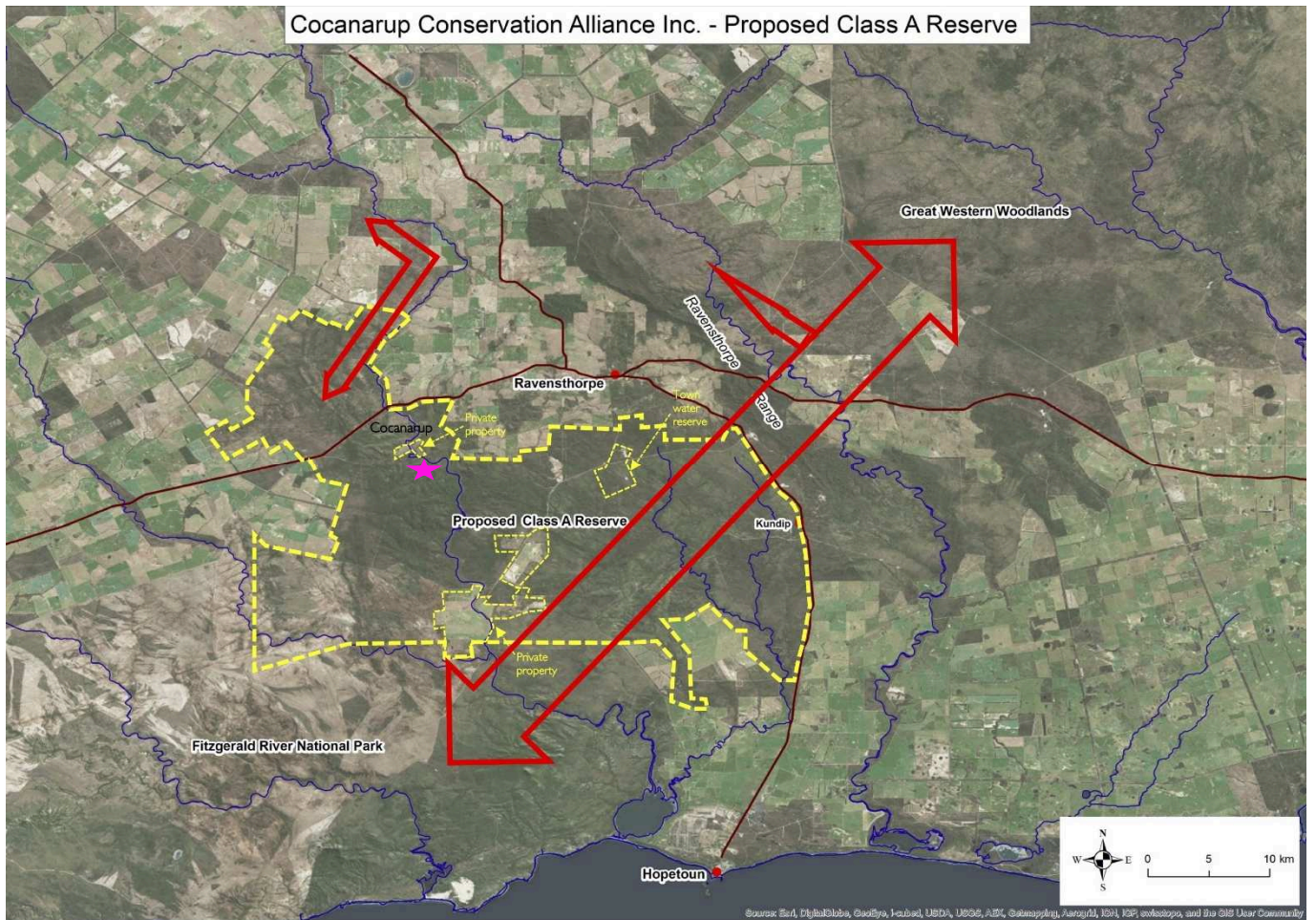


Figure 5. Map showing the linkages and corridors that the proposed Cocanarup – Kundip Class A Reserve forms part of (CCA, 2022). The pink star shows the approximate location of the application area.

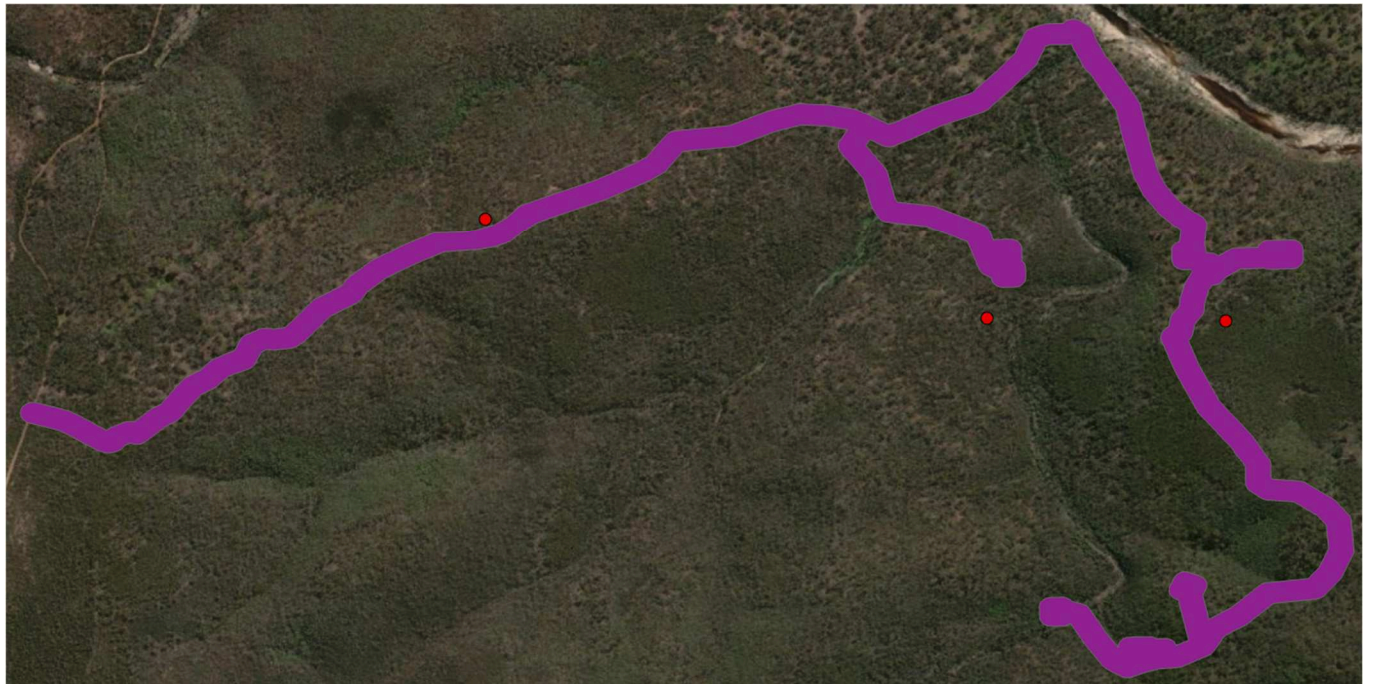


Figure 6. Map of malleefowl mounds nearby application area (Terrestrial Ecosystems, 2022).

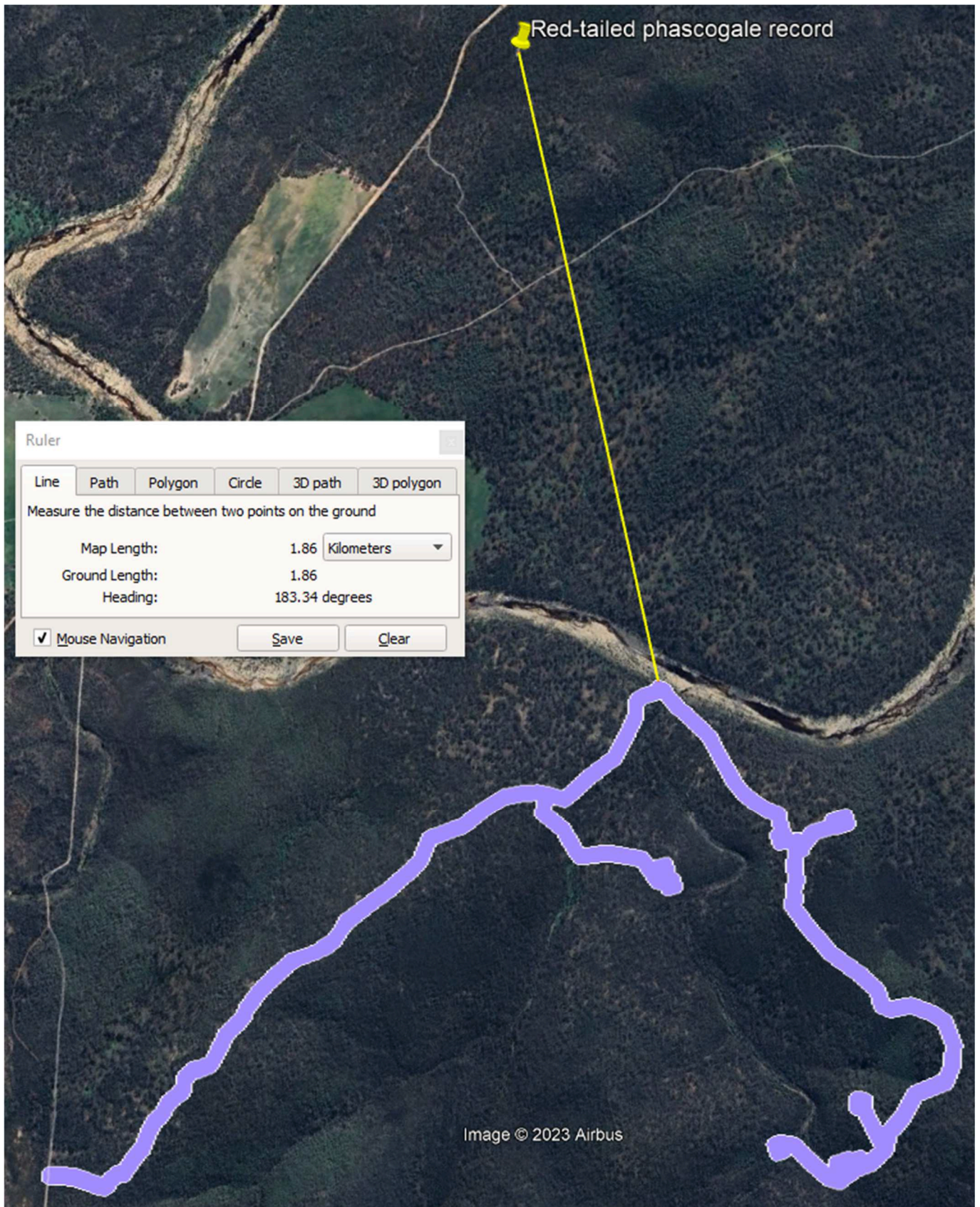
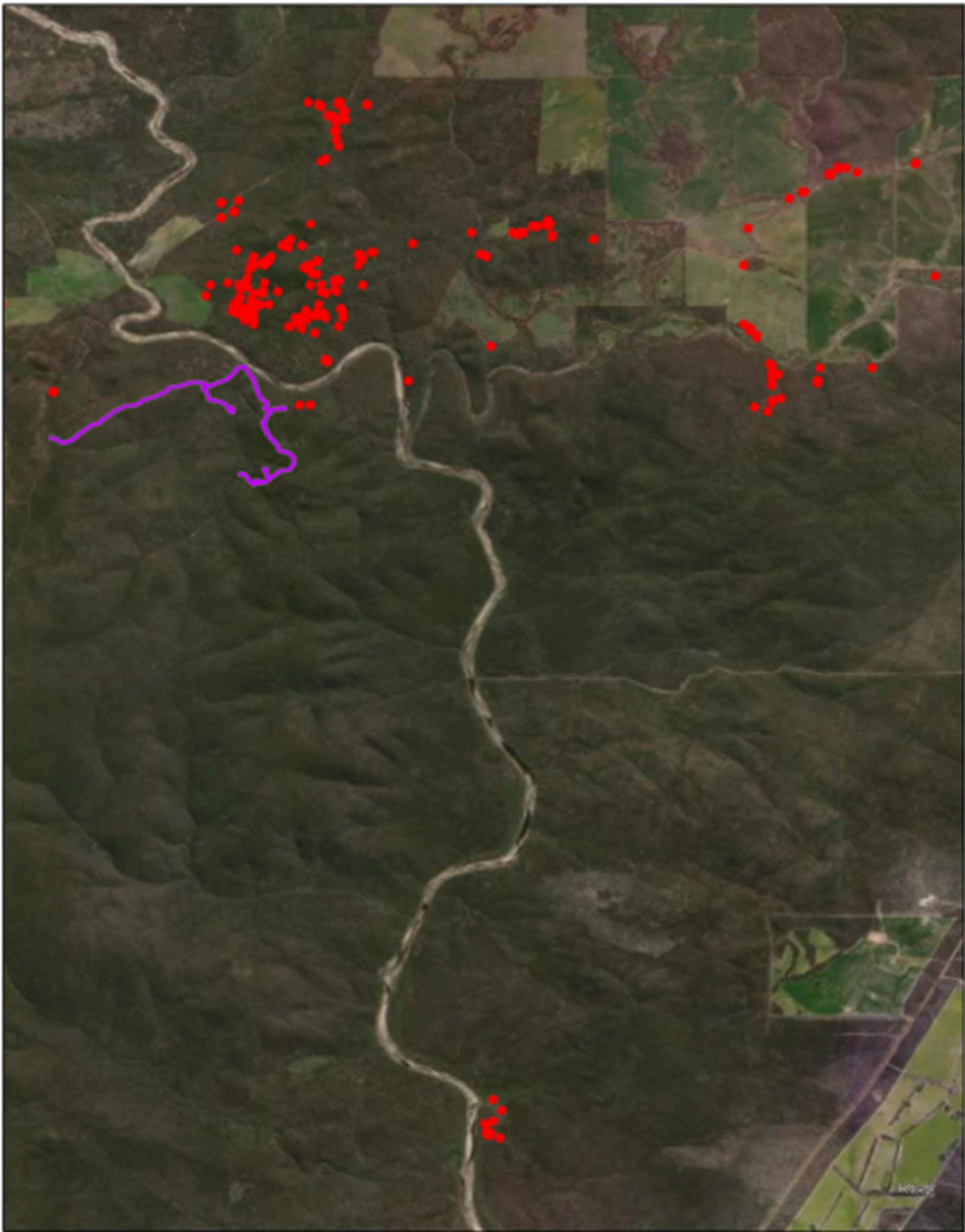


Figure 7. Map showing distance (1.86 kilometres) between the red-tailed phascogale record and the application area (Biddulph & Biddulph, 2023).



0 500 1,000 2,000
Metres

Legend

● Confirmed breeding tree

Figure 8. Map of trees with confirmed breeding activity recorded within the Cocanarup area from 2018 to 2023 (BirdLife Australia, 2023).

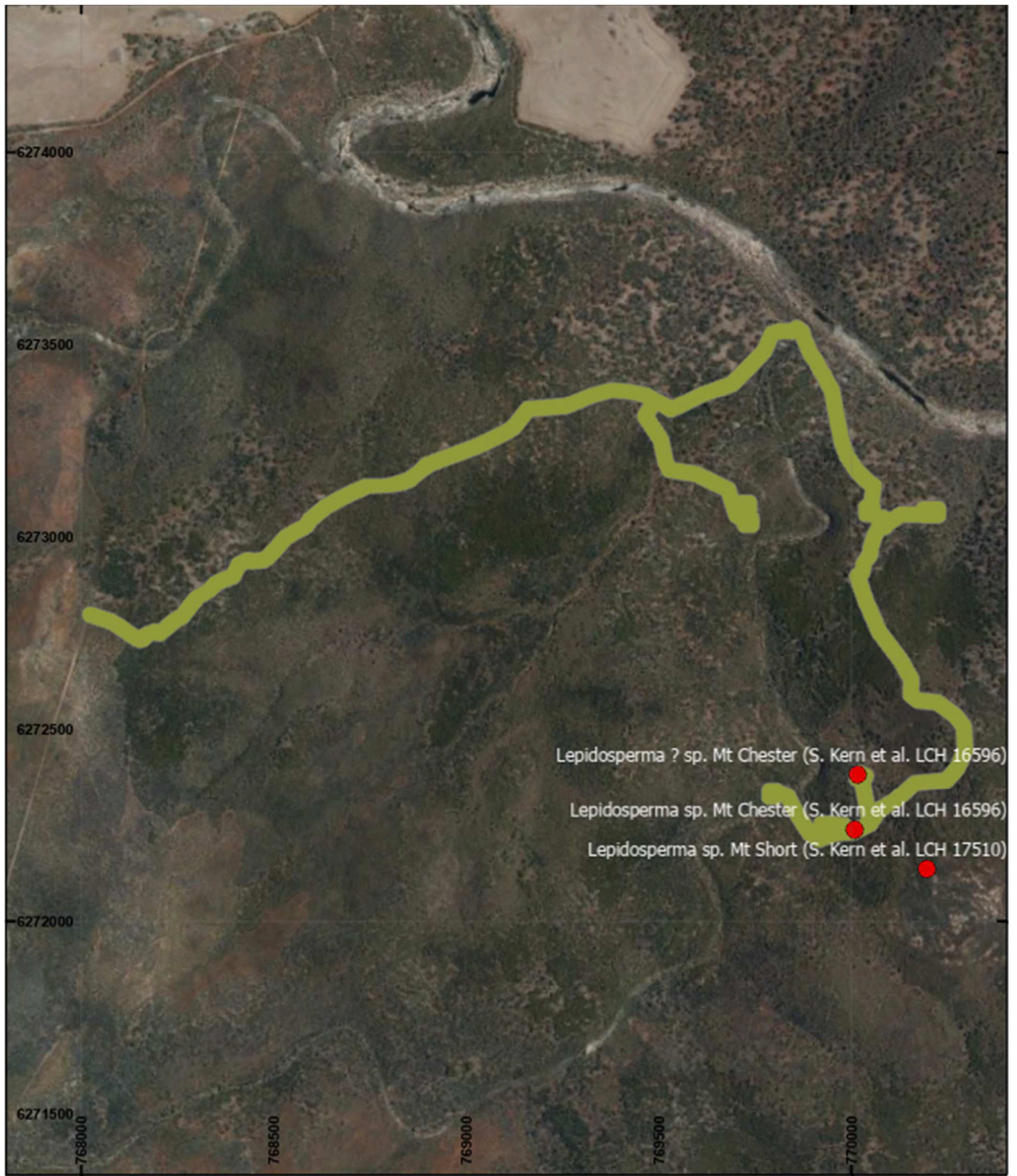





Figure 9. Map of the Priority flora species recorded in the survey area (Biologic, 2022).



Ravensthorpe Lithium Project - NVCP area amendment

 NVCP- Original 220 ha

 NVCP area - Revised 22 ha

 Existing tracks/roads

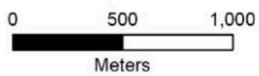


Figure 10. Map showing the reduction of the application area (Bulletin Resources, 2023).

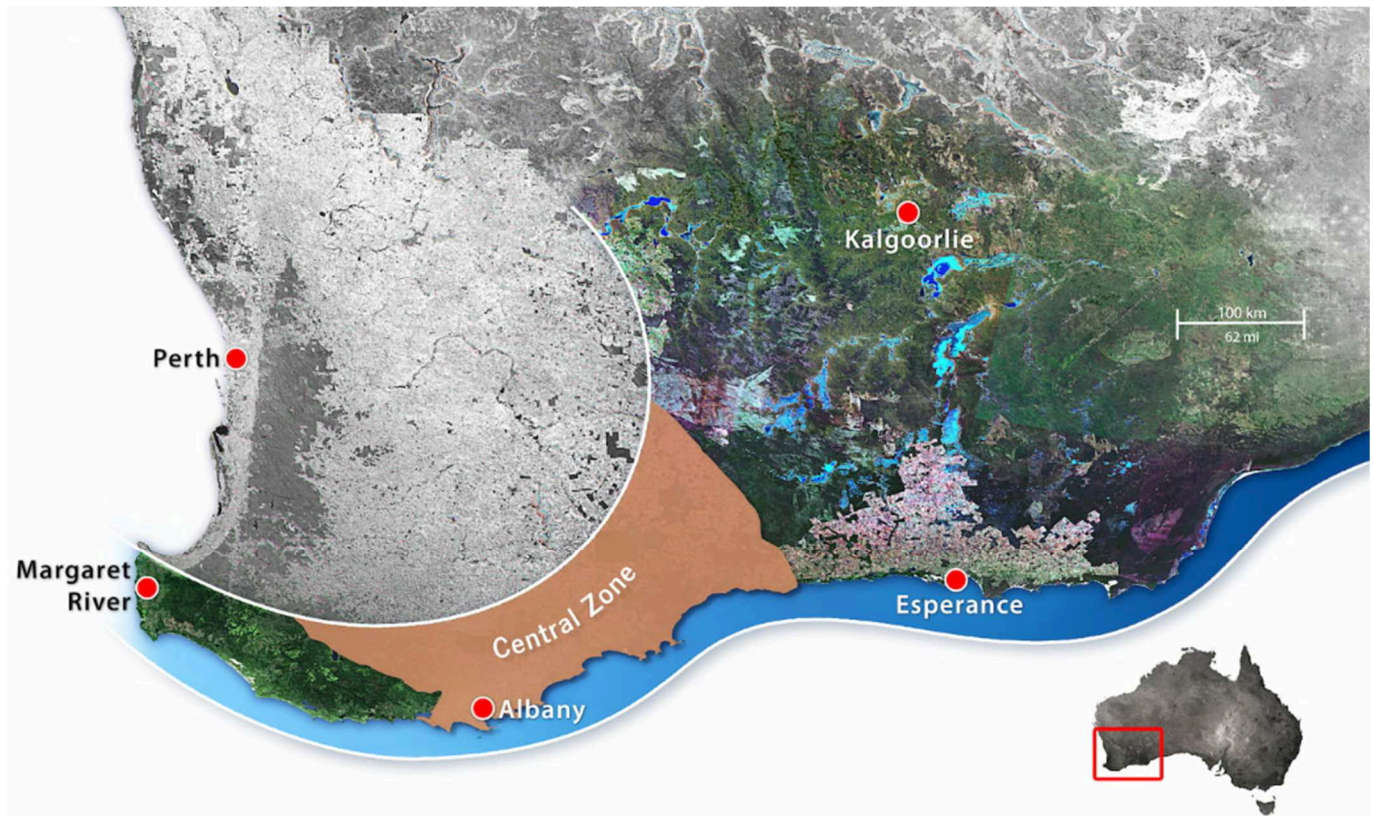


Figure 11. Map showing the Central Zone of the ecological linkage that forms part of the Gondwana Link Program (Gondwana Link, 2024).

Appendix G. Sources of information

G.1. GIS databases

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

- Aboriginal Heritage Places (DPLH-001)
- 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)
- EPA Redbook Recommended Conservation Reserves 1976-1991 (DBCA-029)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Pre-European Vegetation Statistics
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- Soil Landscape Mapping – Rangelands (DPIRD-064)
- WA Now Aerial Imagery

Restricted GIS Databases used:

- Black Cockatoo BC Roosts
- Black Cockatoo BC Feeding SCP
- Black Cockatoo Feeding JF
- Black Cockatoo Feeding Areas Buffered
- Black Cockatoo Carnaby's Distribution

- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

G.2. References

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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) |
| DAWE | Department of Agriculture, Water and the Environment, Australian Government |
| DBCA | Department of Biodiversity, Conservation and Attractions, Western Australia |
| DEMIRS | Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) |
| 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 DEMIRS) |
| DoEE | Department of the Environment and Energy (now DAWE) |
| DoW | Department of Water, Western Australia (now DWER) |
| DPaW | Department of Parks and Wildlife, Western Australia (now DBCA) |
| DPIRD | Department of Primary Industries and Regional Development, Western Australia |
| DPLH | Department of Planning, Lands and Heritage, Western Australia |
| DRF | Declared Rare Flora (now known as Threatened Flora) |
| DWER | Department of Water and Environmental Regulation, Western Australia |
| EP Act | <i>Environmental Protection Act 1986</i> , Western Australia |
| EPA | Environmental Protection Authority, Western Australia |
| EPBC Act | <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act) |
| GIS | Geographical Information System |
| ha | Hectare (10,000 square metres) |
| IBRA | Interim Biogeographic Regionalisation for Australia |

| | |
|-----------------|---|
| IUCN | International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union |
| PEC | Priority Ecological Community, Western Australia |
| RIWI Act | <i>Rights in Water and Irrigation Act 1914</i> , Western Australia |
| TEC | Threatened Ecological Community |

Definitions:

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

T Threatened species:

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

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

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

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

CR Critically endangered species

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

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

EN Endangered species

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

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

VU Vulnerable species

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

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

Extinct Species:

EX Extinct species

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

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

EW Extinct in the wild species

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

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

Specially protected species:

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

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

MI

Migratory species

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

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

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

CD

Species of special conservation interest (conservation dependent fauna)

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

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

OS

Other specially protected species

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

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

P

Priority species:

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

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

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

P1

Priority One - Poorly-known species

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

P2

Priority Two - Poorly-known species

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

P3 Priority Three - Poorly-known species

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

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

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

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

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

Principles for clearing native vegetation:

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