Appendix B: Biological surveys

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CNX Three Mile Hill
Coolgardie Gold Project

Biological Surveys

Prepared for

Focus Minerals Limited

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people • planet • professional

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Executive Summary

Focused Mineral Limited commissioned 360 Environmental (part of SLR Consulting) to undertake a detailed flora and vegetation survey and basic vertebrate fauna and habitat survey at selected sites within the Three Mile Mine Project, Coolgardie. The Survey Area consists of four defined survey areas adjacent to the townsite of Coolgardie, Western Australia, and covers approximately 1360.72 ha.

The purpose of the assessment was to identify key biological values to inform decisions regarding the specific lease areas for proposed construction sites within the Survey Area.

Flora and Vegetation

The flora desktop assessment identified 90 conservation significant taxa occurring within 50 km of the Survey Area, including three Threatened taxa (*Gastrolobium graniticum, Tetratheca spenceri* and *Thelymitra stellata*). A pre-survey likelihood of occurrence assessment was undertaken and determined 20 taxa as having a high likelihood of occurrence, 18 taxa as having a medium likelihood of occurrence, and 51 taxa as having a low likelihood of occurrence. Following the survey, two taxa retained a high likelihood of occurrence.

The detailed flora and vegetation survey was undertaken in between the 11 - 15 October 2021 (Trip 1) and 15 - 19 November 2021 (Trip 2), with the survey recording the floristic composition and vegetation types from 74 quadrats, 22 relevés and 91 mapping notes. A total of 149 taxa were recorded from 78 genera across 35 families.

No Threatened flora taxa pursuant to the Environment Protection and Biodiversity Conservation Act 1999 and/or gazetted as Threatened pursuant to the Biodiversity and Conservation Act 2016 were recorded during the survey.

One Priority listed flora taxon was identified; a single population of *Austrostipa blackii* (P3) consisting of approximately 10 individuals was recorded within a single quadrat. The vegetation it was recorded in was heavily surveyed and no further populations were recorded.

Thirteen introduced taxa were recorded in the Survey Area, of which one, the Common Prickly Pear (**Opuntia stricta*) is listed as a Declared Pest, and a Weed of National Significance.

Ten vegetation types were described and mapped within the Survey Area. Vegetation in the Survey Area was representative of existing broad scale vegetation, as a well as soil and land system mapping for the area.

Vegetation condition ranged from Excellent to Completely Degraded with the majority considered to be in Excellent condition. Evidence of disturbance across the Survey Area included mine works, cattle grazing, vehicle tracks, weeds, and litter.

Vertebrate Fauna

The fauna desktop assessment identified 20 conservation significant species occurring within 50 km of the Coolgardie Survey Area comprising 17 bird species and 3 mammal species.

Fauna habitat mapping was undertaken based on a combination of aerial imagery, field observations and fauna habitat assessment data. Five fauna habitats were mapped within the Survey Area, of which the *Eucalyptus* Woodland and the *Acacia* Shrubland habitat types represent the most value to conservation significant fauna and overall fauna assemblage.

The basic terrestrial vertebrate fauna survey was undertaken in between the 11 – 15 October 2021 (Trip 1) and 15 – 19 November 2021 (Trip 2). This is considered suitable timing to survey for birds, mammals, reptiles, and summer breeding amphibians, but outside the optimal survey period for autumn and winter breeding amphibians. A total of 61 fauna taxa from 33 families comprising of: 42 birds from 21 families, ten mammals from seven families and nine reptiles from five families. No amphibian taxa were recorded.

One conservation significant taxon, the Western Quoll, Chuditch (*Dasyurus geoffroii fortis*) which is listed as Vulnerable under the Biodiversity Conservation Act and Environment Protection and Biodiversity Conservation Act, was recorded within the Survey Area. Chuditch scat was observed during the field survey.

Seven introduced mammal taxa were recorded during the survey, Goat (*Capra hircus*), European Cattle (*Bos primigenius taurus*), Dog/Dingo (*Canis familiaris*), Red Fox (*Vulpes vulpes*), Horse (*Equus caballus*), Cat (*Felis catus*) and Rabbit (*Oryctolagus cuniculus*).

Although outside the scope of this report, potential habitat for Arid Bronze Azure Butterfly (*Ogyris subterrestris petrina*), which is listed as Critically Endangered under the Biodiversity Conservation Act and Environment Protection and Biodiversity Conservation Act, and the Inland Hairstreak butterfly (*Jalmenus aridus*), which is listed as Priority 1 by the Department of Biodiversity, Conservation and Attractions, was observed within the Survey Area.

Abbreviations

Abbreviations used through the report are described below in Table 1.

Table 1: Abbreviations

Abbreviation	Description
BAM Act	Biosecurity and Agriculture Management Act 2007
BC Act	Biodiversity Conservation Act 2016
BoM	Bureau of Meteorology
CD	Conservation Dependent Fauna
CR	Critically Endangered
DAWE	Department of Agriculture, Water, and the Environment
DBCA	Department of Biodiversity, Conservation and Attractions
DoE	Department of Environment
DP	Declared Pest
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EN	Endangered
EP Act	Environmental Protection Act 1986
EPA	Environmental Protection Authority
EPBC Act	Environment Protection Biodiversity and Conservation Act 1999
ESA	Environmentally Sensitive Area
FML	Focus Minerals Limited
GDE	Groundwater Dependent Ecosystem
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
MI	Migratory
MNES	Matters of National Environmental Significance
NVIS	National Vegetation Information System
OS	Other Specially Protected Fauna
P	Priority
PEC	Priority Ecological Community
PMST	Protected Matters Search Tool
T	Threatened
TEC	Threatened Ecological Community
TPFL	Threatened and Priority Flora Database
VU	Vulnerable
WAH	Western Australian Herbarium

Abbreviation	Description
WAM	Western Australian Museum
WoNS	Weeds of National Significance

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1 Introduction

1.1 The Project

Focus Mineral Limited (FML) commissioned 360 Environmental (part of SLR Consulting) to undertake a detailed flora, vegetation, and basic terrestrial vertebrate fauna assessment to support the environmental and planning approvals for proposed expansions to the FML mining operation in Coolgardie Western Australia (the Project).

The 1360.72 ha FML Coolgardie (the Survey Area) is located approximately 40 km southwest of Kalgoorlie in the Coolgardie bioregion of Western Australia. The Survey Area includes multiple polygons representing potential deposits, waste pits, haul roads, and associated infrastructure.

1.2 Objectives and Scope

The purpose of the biological survey was to delineate key flora, vegetation and terrestrial vertebrate fauna values within the Survey Area and identify potential environmental sensitivities that may impact The Project.

The scope of works includes:

- Undertake a desktop assessment including relevant database searches and a literature review to compile and summarise existing records of flora, vegetation, and terrestrial vertebrate fauna (including conservation significant species and communities) within the vicinity of the Survey Area
- Undertake a detailed flora and vegetation survey in accordance with EPA Technical Guidance (Environmental Protection Authority, 2016)
- Undertake targeted searching for flora of conservation significance within the Survey Area
- Undertake a basic terrestrial vertebrate fauna survey in accordance with EPA Technical Guidance (Environmental Protection Authority, 2020)
- Identify and assess conservation significant terrestrial vertebrate fauna or suitable conservation significant terrestrial vertebrate fauna habitat potentially occurring within the Survey Area
- Produce a technical report based on the findings of the above
- Supply a geospatial data package prepared in accordance with IBSA requirements.

This report presents the outcomes of the FML Coolgardie flora, vegetation, and terrestrial vertebrate fauna assessment undertaken to support the above objectives.

2 Background

2.1 Protection of Flora, Vegetation and Fauna

Western Australian flora and fauna is protected formally and informally by legislative and non-legislative measures:

Legislative measures:

- *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *WA Biodiversity Conservation Act 2016* (BC Act)
- *WA Environmental Protection Act 1986* (EP Act)
- *WA Biosecurity and Agriculture Management Act 2007* (BAM Act).

Non-legislative measures:

- WA Department of Biodiversity Conservation and Attractions (DBCA) Priority lists for fauna, flora, and ecological communities
- Weeds of National Significance (WoNS)
- Recognition of locally significant populations by DBCA.

These protection mechanisms are supported by guidance documents published by the Environmental Protection Authority (EPA) and Department of Agriculture, Water, and the Environment (DAWE):

- *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (Environmental Protection Authority, 2016)
- *Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (Environmental Protection Authority, 2020)
- *Matters of National Environmental Significance Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (Department of the Environment, 2013)
- *Survey Guidelines for Australia's Threatened Mammals* (Department of Sustainability Environment Population and Communities, 1999)
- *Survey Guidelines for Australia's Threatened Reptiles* (Department of Sustainability Environment Water Population and Communities, 2011)
- *Survey Guidelines for Australia's Threatened Birds Under the Environment Protection And Biodiversity Conservation Act 1999* (Department of the Environment Water Heritage and the Arts, 2010).

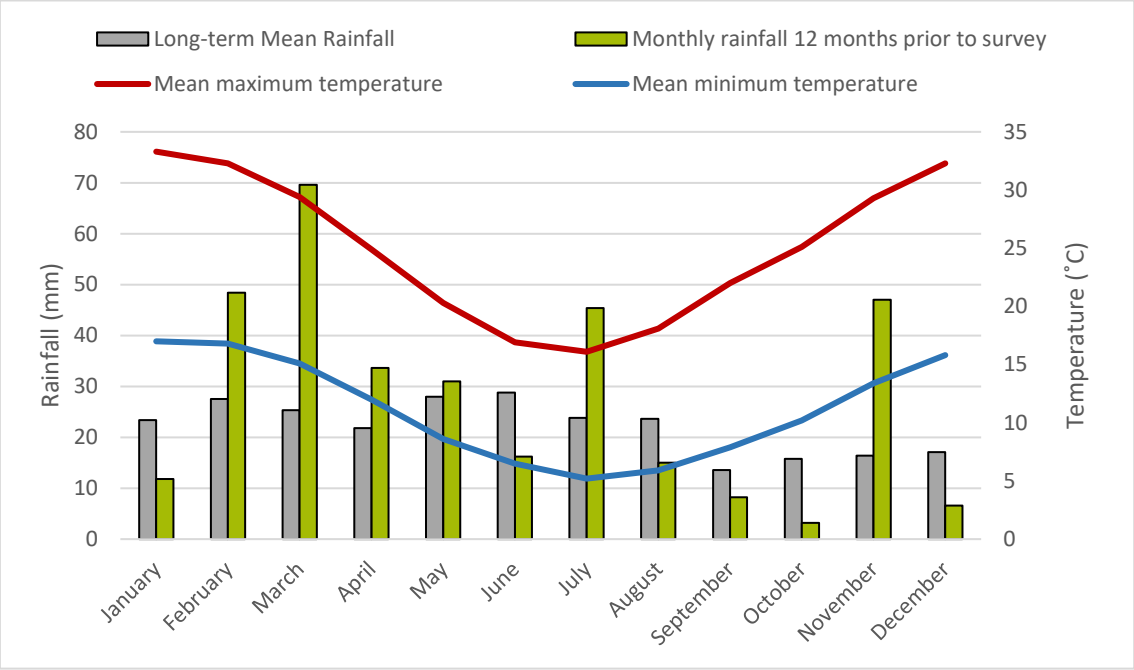
2.2 Existing Environment

2.2.1 Climate

The closest long-term Bureau of Meteorology weather station with a complete dataset is Coolgardie weather station (Station 012018) for climate data (i.e. temperature) and Koorarawalyee weather station (Station 012152) for rainfall data. The Coolgardie weather station is located approximately 75 km south of the Survey Area. Koorarawalyee weather station is located approximately 124 km southwest of the Survey Area.

The long-term mean minimum temperature for Coolgardie Weather Station ranges from 5.2˚C (July) to 16.8˚C (February) (1893 to 2020) and the long-term mean maximum temperature ranges from 16.1˚C (July) to 33.3˚C (January) (Graph 1) (Bureau of Meteorology, 2021).

The Koorarawalyee weather station recorded 336 mm of rainfall in the 12 months prior to the survey (October 2021 to November 2021), which is 66.4 mm above the long-term average of 269.6 for the same period (Bureau of Meteorology, 2021). In the three months prior to the survey (July 2021 to September 2021), 68.6 mm of rainfall was recorded, which is 7.6 mm above the long-term average of 61 mm for the same period (Bureau of Meteorology, 2021).



Graph 1: Long term and 2021 monthly weather and climate data for Coolgardie and Koorarawalyee

2.2.2 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical, and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (Department of the Environment and Energy, 2016). The Survey Area occurs within the Coolgardie bioregion and Eastern Goldfield (COO3) subregion.

The Eastern Goldfield (COO3) subregion lies on the Yilgarn Cratons 'Eastern Goldfields Terrains'. The relief is subdued and comprises of gently undulating plains interrupted in the west with low hills and ridges of Archaean greenstones and in the east by a horst of Proterozoic basic granulite.

2.2.3 Soils and Land Systems

Soil landscapes and land system mapping of Western Australia describes broad soil and landscape characteristics from regional to local scales, ranging from 1:20,000 to 1:250,000 (Department of Primary Industries and Regional Development, 2018). The Survey Area occurs entirely within the BB5 land system, characterised by rocky ranges and hills of greenstones with basic igneous rocks as well as sandplains with brown calcareous loam (Figure 2) (Department of Primary Industries and Regional Development, 2018).

2.2.4 Hydrography

The Survey Area contains one small-permanent pool which is just south of Coolgardie-Esperance Highway, named Coolgardie Gorge. The Survey Area also contains four decommissioned deep abandoned mining pits which contain water and several minor watercourses that don't influence vegetation types present. The nearest major hydro geographical feature is a seasonally filled salt lake approximately 6 km east of the Survey area. The salt lake joins the Red, White and Douglas lakes as part of a larger interconnected salt lake system, which flows in a south westerly direction (Figure 2) (Department of Water and Environmental Regulation, 2018).

2.2.5 Broad Vegetation Types

Mapping of pre-European vegetation in Western Australia was completed on a broad scale (1:1,000,000) by Beard, (1976). These vegetation types were later refined by Shepherd, Beeston and Hopkins, (2002) resulting in 819 vegetation types.

Two broad vegetation associations are mapped over the Survey Area (Figure 3). Representation of the vegetation associations at a local, regional, and state level is shown in Table 2.

- **Coolgardie 9 –** Medium woodland; Eucalyptus woodland / Eremophila sparse shrubland. Associated species are coral gum (*Eucalyptus torquata*) and goldfields blackbutt (*E. lesouefii*)
- **Coolgardie 1294 –** Eucalyptus woodland. Wheatbelt; York gum, salmon gum etc. (*Eucalyptus loxophleba*, *E. salmonophloia*). Goldfields; gimlet, redwood etc. (*E. salubris*, *E. oleosa*). Riverine; rivergum (*E. camaldulensis*). Tropical; messmate, woolybush.

Table 2: Broad Vegetation Types within the Survey Area and their Representation at the State, Regional and Local Levels (Government of Western Australia, 2019)

System and Vegetation Association	Extent			
	Pre-European (ha)	Current (ha)	Remaining (%)	Managed in DBCA Lands (%)*
Representation across Western Australia				
9	240,509.33	235,161.94	97.78	8.07
1294	6,295.55	6,047.45	96.06	1.90
Representation across the Coolgardie Bioregion				
9	240,441.99	235,100.97	97.78	8.07
1294	6,295.55	6,047.45	96.06	1.90
Representation across the Eastern Goldfields Subregion				
9	235,047.15	229,757.07	97.75	8.26
1294	6,295.55	6,047.45	96.06	1.90
Representation across the Shire of Coolgardie				
9	166,572.37	163,720.39	98.29	9.81
1294	3,385.95	3,378.94	99.79	3.40

*as a portion of the current extent

2.2.6 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs) or significant wetlands.

The Survey Area does not occur within a mapped ESA. The nearest ESA is the Rowles Lagoon Conservation Park located approximately 52 km north-west of the Survey Area (Department of Water and Environmental Regulation, 2020).

2.2.7 Conservation Areas

The Survey Area is not located within any listed conservation area (Department of Biodiversity Conservation and Attractions, 2021a). The nearest conservation area is the Kangaroo Hills Timber Reserve which is situated adjacent to the southernmost section of the Survey Area separated by Nepean Road (Figure 4).

2.2.8 Land Use

The dominant land use of the Eastern Goldfields subregion include: Unoccupied Crown Land (UCL) and Crown reserves, Grazing-Native pastures-leasehold, freehold, conservation, and Mining leases (Cowan, 2001).

The Survey Area covers sections of land classified as: mining lease, prospecting licence, and miscellaneous licence (Data WA, 2021). The Survey Area has a long history of mining activities, with extensive mine diggings including deep open pits and deep localised mine shafts.

3 Methods

3.1 Desktop Assessment

3.1.1 Literature Review

Background information on the Survey Area and surrounds was compiled prior to the field survey (see Section 3.1.1). Historical vegetation mapping (Beard, 1976; Shepherd, Beeston and Hopkins, 2002), land systems mapping (Department of Agriculture and Food WA, 2012), and the IBRA classification system (Cowan, 2001) were consulted to provide broad contextual knowledge of the vegetation units and habitat likely to be encountered within the Survey Area.

The literature review also considered a selection of biological reports detailing assessments undertaken in the region that were publicly available:

- Coolgardie Landfill - Flora, vegetation and fauna habitat assessment (Strategen Environmental, 2019)
- Fauna survey for Mungari Gold Operations Cutters Ridge Project (Phoenix Environmental Sciences, 2019)
- Flora and Vegetation Impact Assessment - Medcalf Project (Botanica Consulting, 2020)
- Level 1 Vertebrate Fauna Risk Assessment for Lot 500 Kalgoorlie West (Terrestrial Ecosystems, 2018)
- Reconnaissance Flora and Vegetation Survey for the Mt Marion Project Area (Native Vegetation Solutions, 2019)
- Reconnaissance Flora and Vegetation Survey of Lot 500 Great Eastern Highway Kalgoorlie (Native Vegetation Solutions, 2018)
- Reconnaissance Flora and Vegetation Survey of the Spargos Project - October 2020 (Native Vegetation Solutions, 2020)
- Vegetation Clearing - Fauna Assessment (Davyhurst, Callion, Waihi, Siberia, Riverina Clearance Areas) (Biostat Pty Ltd, 2020).

3.1.2 Database Searches

Database searches were undertaken to compile a list of potential flora and fauna and identify potential conservation significant flora, fauna, and ecological communities within or surrounding the Survey Areas (Table 3). In addition, an EPBC Protected Matters Search (PMST) was undertaken to identify the potential for Matters of National Environmental Significance (MNES) to occur within or surrounding the Survey Areas (Department of Agriculture Water and the Environment, 2020).

The search area for each parameter was varied to reflect distances recommended by DBCA. The search areas are herein referred to collectively as the Study Area.

Table 3 Database Searches of the Survey Area

Database Name	Date Received	Search Target	Search Area
Threatened and Priority Ecological Communities database search (Department of Biodiversity Conservation and Attractions, 2022)	7 October 2021	TECs and PECs	50 km buffer around the Survey Area
Threatened and Priority Flora (TPFL) database search (Department of Biodiversity Conservation and Attractions, 2021d)	7 October 2021	Threatened and Priority Flora	60 km buffer around the Survey Area
Western Australian Herbarium flora database search (Department of Biodiversity Conservation and Attractions, 2021e)			60 km buffer around the Survey Area
DBCA Threatened and Priority Fauna database search (Department of Biodiversity Conservation and Attractions, 2021c)	18 October 2021	Threatened and Priority Fauna	50 km buffer around Survey Area
NatureMap (Department of Biodiversity Conservation and Attractions, 2021b)	27 October 2021 (flora) 02 November 2021 (fauna)	Threatened and Priority flora and fauna, and inventory of potential flora and fauna	20 km buffer around the Survey Area (flora) 40 km buffer around Survey Area (fauna)
Protected Matters Search Tool (PMST) (Department of Agriculture Water and the Environment, 2021a)	25 October 2021	Commonwealth listed Threatened flora and fauna and TECs	50 km buffer around the Survey Area

3.1.3 Likelihood of Occurrence

Conservation significant flora and fauna species identified from the desktop assessment were assessed to determine the likelihood of their occurrence within the Survey Area, both prior to and post field survey. The assessment was completed based on the likelihood of occurrence criteria presented in Table 4.

Only species either recorded within the Survey Area or considered as having a high or medium likelihood of occurrence will be discussed in detail. Species classified as having a low likelihood of occurrence based on the above criteria will not be discussed unless a justification for this classification is required.

For fauna, taxa listed as Marine only under the EPBC Act were not included as conservation significant taxa because the Marine only listed taxa identified by the desktop assessment and field survey were common and widespread, taxa listed as Marine only do not constitute matters

of national environmental significance (MNES) under the EPBC Act, and the Survey Area does not contain any marine habitat.

Table 4 Likelihood of Occurrence Criteria

Rank	Criteria
Previously Recorded	The species has been previously recorded in the Survey Area
High (Likely to occur)	• Preferred habitat capable of supporting individuals or populations is present within the Survey Area • The survey Areas is within the taxon's known distribution • There are existing records of the species near the Survey Area (within 15 km) (flora) • There are existing records of the species near the Survey Area recorded within the last 15 years (fauna) • The species is strongly linked to a specific habitat, which is present in the Survey Area • The species has more general habitat preferences, and suitable habitat is present.
Medium (May occur)	• There is suitable (not necessarily preferred) habitat in the Survey Area, but the species is recorded infrequently in the locality • The Survey Area is within or near the taxon's known distribution • They Survey Area and surrounding area may support individuals or populations present within the Survey Area • There are existing records of the species from the locality (within 30 km for flora and 50 km for fauna), however: ○ The species is strongly linked to a specific habitat, of which only a small amount is present in the Survey Area ○ The species has more general habitat preferences, but only some suitable habitat is present.
Low (Unlikely to occur)	• No suitable habitat is present within the Survey Area, or the Survey Area is well outside the taxon's known distribution for the taxon is considered locally or regionally extinct • The Survey Area and surrounding habitat are unlikely to support individuals or populations of the taxon, however individuals may rarely occur as transients or vagrants • The species is linked to a specific habitat, which is absent from the Survey Area; or • Suitable habitat is present, however there are no existing records of the species from the locality despite reasonable previous search effort in suitable habitat; or • There is some suitable habitat in the Survey Area, however the species is very infrequently recorded in the locality.

3.2 Field Survey Effort

3.2.1 Trip 1

The biological survey was undertaken between the 11 - 15 October 2021.

The flora, vegetation and fauna survey was undertaken by Senior Botanist Jason Webb, Principal Zoologist Dr Michael Lohr and Ecologist Lachlan Crossley. The field team has over 20 years of combined experience conducting surveys of similar scope throughout Western Australia.

3.2.2 Trip 2

The biological survey was undertaken between the 15 - 19 November 2021.

The flora, vegetation and fauna survey was undertaken by Senior Botanist Jason Webb, Principal Ecologist Scott Walker and Ecologists Bridget Duncan and Lachlan Crossley. The field team has over 20 years of combined experience conducting surveys of similar scope throughout Western Australia.

The survey effort from both trips is shown in Figure 5.

3.3 Flora and Vegetation

3.3.1 Establishment of Flora Sites

Indicative flora sites were identified prior to the survey using aerial photography to estimate broad vegetation patterns within the Survey Area. The location and number of flora sites completed were adjusted on site to achieve sites most representative of the vegetation present.

Where possible, at least three flora sites were sampled for each vegetation type observed within the Survey Area. Some vegetation types that were not large enough to accommodate three flora sites had only one or two sites sampled.

Flora sites consisted of quadrats (20 m x 20 m) and relevés of approximately 400 m^2 where possible, or alternate configurations approximately equating to 400 m^2 (as required in areas such as drainage lines, gullies, and narrow ridge lines). A comprehensive record of the flora present at the time of sampling was recorded for both quadrat and relevé sites.

Flora site locations were recorded using a handheld GPS, the start and finish point of linear relevés, and the central point of circular relevés. At each flora site, the following was recorded:

- Site code
- Date and personnel
- Landform and soil description
- Relevant site descriptors including, slope, aspect, litter cover, bare ground cover and fire history
- Inventory of vascular flora including the approximate average height and percent foliar cover for each taxon recorded
- Vegetation description in accordance with the National Vegetation Information System (NVIS), Level 5 ‘association’, whereby the dominant growth form, height, cover, and species (three species) for the three traditional strata (upper, mid, and ground) are described are described

- Vegetation condition in accordance with the Southwest and Interzone Botanical Provinces/Eremaean and Northern Botanical Provinces vegetation condition scale (Environmental Protection Authority, 2016a), and evidence of disturbance (for example clearing, rubbish, feral animals, weed incursion and evidence of feral animals and dieback) where present, and
- Photograph of the vegetation occurring within the site.

A total of 74 quadrats, and 22 relevés were established within the Survey Area. An additional 91 mapping notes were completed to aid vegetation mapping delineation.

3.3.2 Opportunistic Flora

Additional flora taxa observed opportunistically around flora sites or while traversing on foot within the Survey Area were also recorded. Where populations of conservation significant flora taxa, Declared Pests (DPs) or WoNS were encountered, a GPS location and a count of the individuals present was recorded.

3.3.3 Targeted Searching

Prior to the survey conservation significant flora with the likelihood or potential to occur within the Survey Area was compiled (see section 3.1.3). Field personnel familiarised themselves with photographs, reference samples and descriptions of these taxa before conducting the survey.

The entire Survey Area was not systematically searched. Rather, targeted searching focussed on habitat suitable for Conservation Significant Flora. Furthermore, potential habitat within the proposed footprint was prioritised for targeted searching over areas outside the proposed footprint.

Personnel also actively searched for conservation significant flora species in and around flora sites, while traversing on foot within the Survey Area and in known locations or preferred habitat encountered in the Survey Area.

Where Threatened or Priority flora were encountered in the field a GPS location was taken and a count of individuals was recorded, followed by a search in the local vicinity to determine if any other individuals were present nearby and delineate population boundaries where relevant. Specimens of any potential conservation significant flora that could not be identified in the field were collected for identification and lodgement at the Western Australian Herbarium (WAH).

3.3.4 Statistical Analyses

Statistical analysis of quadrat data was undertaken in accordance with EPA guidelines for a detailed flora and vegetation survey.

3.3.4.1 Species Accumulation Curve

Species accumulation curves were plotted using Primer-E version 6.1.5. to determine the adequacy of the survey (Clarke and Gorley, 2006). The treatments comprised Sobs (Mao Tao), to reflect the number of species observed (based on a given total of species recorded), and richness estimators Chao 1, Chao 2, Jacknife 1, Bootstrap and Michaelis-Menton to estimate the total sample size of flora taxa present. Species accumulation curves for this survey were calculated using data collected from the flora sites within the Survey Area. All flora taxa, both annual and perennial, within each flora site were used in generating the species accumulation curve. Unconfirmed flora were included if they were the only species present from a Genus.

3.3.5 Taxonomy and Nomenclature

Where field identification of plant taxa was not possible, specimens were collected for identification using resources of the WAH. Identification of flora collections was completed by experienced Taxonomist Frank Obbens.

The finalised species list was cross-referenced against current flora databases and relevant taxonomic literature (Western Australian Herbarium, 2021) to determine name currency, conservation status and known distribution of each taxon. Introduced species were compared against the current BAM Act Declared Plants list the WoNS list to determine their control status (Department of Agriculture Water and the Environment, 2021b; Department of Primary Industries and Regional Development, 2021).

Any conservation significant flora taxa, including potential Threatened and Priority species, range extensions and potential new taxa were submitted to the WAH for verification and lodgement. Where relevant, Threatened and Priority Flora Report Forms (TPFRFs) were submitted to DBCA.

3.3.6 Vegetation Unit and Condition Mapping

Broad vegetation and condition mapping was conducted in the field, with boundaries delineated over aerial photography, at a scale of 1:5,000. Broad vegetation units were refined based on taxonomic identification of flora collections, statistical analysis of data collected from the quadrats and relevés, and mapping notes taken during the field survey. Vegetation condition mapping was refined based on site data and mapping notes. Finalised polygons were digitised and produced as electronic mapping data using GIS software.

3.4 Vertebrate Fauna

3.4.1 Vertebrate Fauna Habitat Assessment

Fauna habitat assessments were undertaken throughout the Survey Area to identify fauna habitat values. Habitat assessment locations are displayed in Figure 5. The following information, which has been adapted from the habitat attributes listed in the Technical Guidance (Environmental Protection Authority, 2020), was collected at each habitat assessment site using Fulcrum, a mobile data collection app:

- Site photo
- Landform
- Soil type and colour
- Rock types, surface stone cover and size classes
- Key habitat and microhabitat features including leaf litter, logs, burrows, rocky outcrops, rock crevices, hollows, water sources
- Habitat quality, fire history and evidence of disturbance
- General description of vegetation structure.

Fauna habitat mapping boundaries were delineated over aerial imagery at a scale of approximately 1:5,000 based on field observations and fauna habitat assessment data. Polygons were digitised and produced as electronic mapping data using GIS software.

3.4.2 Opportunistic Fauna Records and Active Searches

Opportunistic observations of fauna were recorded throughout the Survey Area. Observations of primary evidence (direct sightings, calls) and secondary evidence (tracks, scats, diggings etc.) were recorded. Active searches were undertaken throughout the Survey Area in microhabitats likely to contain fauna. They primarily involved raking leaf litter, peeling bark, and splitting dead wood.

3.4.3 Identification and Taxonomy

Where there was doubt on a species name (through subsequent name changes or taxonomic reviews), an effort was made to determine the current scientific name for each taxon. Taxonomy and nomenclature in this report follows the WA Museum checklist 2021 (Western Australian Museum, 2021) where relevant.

4 Results

4.1 Limitations

Limitations and constraints of the flora, vegetation and fauna survey are detailed below in Table 5

Table 5: Limitations and Constraints Associated with the Survey

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
Survey Scope	Not a constraint	The detailed flora and vegetation survey was undertaken in accordance with EPA Technical Guidance (Environmental Protection Authority, 2016) and was considered appropriate to support approvals applications. Targeted searching for flora of conservation significance was undertaken, however, systematic searches were not feasible. Rather, targeted searching focused on habitat suitable for conservation listed flora within the proposed development footprint. A basic terrestrial vertebrate fauna survey was undertaken in accordance with EPA Technical Guidance (Environmental Protection Authority, 2020) and was considered appropriate to support approvals applications.
Availability of Data	Not a constraint	All data required to complete the scope of works including regional and local contextual information was available.
Site Access	Not a constraint	The Survey Area was able to be accessed by vehicle and on foot.
Survey Intensity and Resources	Not a constraint	A total of 96 flora sites (comprising 74 quadrats and 22 relevés) were sampled across the Survey Area. An additional 91 mapping notes were undertaken to aid vegetation mapping and delineation. Sufficient time was allocated to the flora and vegetation survey, given the size and complexity of the Survey Area, and the expected level of survey intensity. The survey effort was considered adequate to assess the flora and vegetation values of the Survey Area and provide information required to support approvals applications. Eighty fauna habitat assessments were completed, and 61 fauna taxa were recorded opportunistically throughout the Survey Area. The survey effort was appropriate for a basic terrestrial vertebrate fauna survey.

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
Experience	Not a constraint	The flora and vegetation surveys were undertaken by Senior Botanist Jason Webb and Botanist Bridget Duncan, who have over 5 years combined experience conducting surveys of similar scope throughout Western Australia. Identification of flora collections was completed by experienced taxonomist Frank Obbens at the WAH. Any specimens with novel characteristics were submitted to the WAH for formal identification. The fauna survey was undertaken by Lachlan Crossley (Ecologist), Dr. Michael Lohr (Principal Zoologist) and Scott Walker (Principal Ecologist), who have 25 years of combined experience conducting fauna surveys. Fauna identification was reviewed by Dr. Michael Lohr (Principal Zoologist) and Evan Webb (Senior Zoologist), using photos of tracks and scats taken during the field survey.
Timing, weather, season	Not a constraint Partial limitation for fauna (Amphibians)	The recommended primary survey period for the region as per the EPA Technical Guidance, is September to November. Survey was conducted in October and November 2021. Rainfall was sufficient prior to the commencement of the field survey and air temperatures were slightly below average. Therefore, weather conditions were not a constraint. According to the EPA Technical Guidance, mammals do not have a preferred time of year for optimal observation. For reptiles, the guidance suggests October to December (for primary survey). As the surveys were conducted in October and November, timing was suitable for reptiles. The optimum timing for observation of amphibians is between May and August (autumn-winter breeders) and November-December (summer breeders). Therefore, the timing of the surveys was not suitable for autumn-winter breeders. The optimum time to observe birds is between September and December for most bush birds and between November and March for migratory birds. As the surveys were conducted in October and November, timing was suitable for birds.
Life Forms Sampled	Not a constraint	The Survey Area was traversed by vehicle and on foot and representative sites of all remnant vegetation were sampled. All flora species encountered within the Survey Area were recorded. A total of 145 vascular flora taxa were recorded from the Survey Area, comprising 93.8% native flora taxa and 6.2% introduced flora taxa. Of the 145 flora taxa recorded, 18 taxa (12.4%), could not be identified to species level because they were sterile at

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
		the time of the survey. This was not considered a constraint as it represented a very small portion of the flora sampled. None of the unknown flora taxa collected were analogous to Threatened or Priority flora taxa identified by the database searches as likely to occur within the Survey Area, nor were they representative of flora of other significance. The basic vertebrate fauna survey used a range of techniques to detect fauna taxa within the Survey Area. A total of 61 vertebrate fauna taxa were recorded within the Survey Area, comprising 54 confirmed native taxa and seven introduced taxa. All fauna taxa recorded were able to be identified to species level by direct or indirect observation with a high level of confidence.
Mapping Reliability	Not a constraint	Vegetation types were described and mapped based on quadrat/relevé data and additional mapping notes taken during the field survey. The number of sites and coverage of the Survey Area was considered sufficient to inform the survey. Fauna habitat mapping was based largely on vegetation mapping and there were no constraints on mapping reliability.
Disturbances (fire, flood etc.)	Not a constraint	No disturbances occurred during any of the surveys. Areas of disturbance associated with clearing, mining, rubbish, weeds, and the presence of introduced fauna were recorded but were not a constraint on the results of the survey.
Completeness	Not a constraint	The survey was considered complete for a detailed flora and vegetation survey and basic vertebrate fauna survey. All vegetation types and fauna habitats were surveyed and delineated within the Survey Area, however not all vegetation types were surveyed with three flora sites; five vegetation types were surveyed with one or two flora sites.

4.2 Flora and Vegetation

4.2.1 Literature Review

The key findings of the flora and vegetation reports reviewed are summarised in Appendix A1.

4.2.2 Database Searches

Database searches identified 90 conservation significant flora species occurring within 50 km of the Survey Area (Figure 6, Appendix B), comprising:

- Three Threatened taxa
- Twenty-seven Priority 1 taxa

- Fourteen Priority 2 taxa
- Forty Priority 3 taxa, and
- Six Priority 4 taxa.

4.2.3 Likelihood of Occurrence

The pre-survey likelihood of occurrence assessment identified that of the 90 conservation significant flora species identified by the desktop assessment:

- 20 were considered to have a high likelihood of occurrence
- 18 were considered to have a medium likelihood of occurrence
- 51 were considered to have a low likelihood of occurrence.

Following the survey, the likelihood of occurrence was re-assessed and found:

- Two taxa were considered to have a high likelihood of occurrence, due to close records and existing, contiguous habitat within the Survey Area.

The likelihood of occurrence assessment is provided in Appendix C.

4.2.4 Vegetation of Conservation Significance

Database searches did not return any listed Threatened Ecological Communities or Protected Ecological Communities within 50 km of the Survey Area.

4.2.5 Flora Composition

The survey recorded a total of 149 taxa from 78 genera across 35 families (Appendix D). The dominant families were Chenopodiaceae (26 taxa) and Myrtaceae (15 taxa). The most dominant genera were *Eucalyptus* (12 taxa) and *Eremophila* (10 taxa).

4.2.6 Flora of Conservation Significance

4.2.6.1 Threatened or Priority Flora

No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened pursuant to the BC Act 2016 were recorded during the survey.

One Priority taxon was recorded within the Survey Area (Figure 7a, Plate 1). A population consisting of approximately 10 individuals of *Austrostipa blackii* (P3) was recorded in quadrat C1Q01. This taxon is a tufted, perennial, grass, typically growing up to 1 m high that flowers between September and November. The WAH has 41 specimens lodged with records across the Avon Wheatbelt, Coolgardie and Yalgoo bioregions (Western Australian Herbarium, 2022). The habitat descriptions for this taxon are typically mixed Eucalypt species, tall Acacia shrublands and open woodlands of *Allocasuarina dielsiana* and *Allocasuarina tessellata* (Western Australian Herbarium, 2022). *Austrostipa blackii* (P3) grows on gently inclined lower slopes of basalt with red-brown deep sandy clay loam soils (Western Australian Herbarium, 2022).

Plate 1: *Austrostipa blackii* (P3)

Within the Survey Area it was recorded within vegetation unit AcEoaDl (quadrat C1Q01), in association with *Acacia collegialis, Eremophila* spp. and *Dodonaea lobulata*. This vegetation type was sampled heavily and was not recorded at any other site.

4.2.7 Introduced Taxa

A total of 13 introduced taxa were recorded within the Survey Area, representing 8.7% of the total taxa recorded (Table 6). One taxon (**Opuntia stricta*) is a Declared Pest and listed as a WoNS (DAWE, 2021b; DPIRD, 2021). Eight individuals of **O. stricta* were recorded (Figure 8).

Three introduced taxa are unlisted under the BAM Act, which prohibits them access to Western Australia, however they are not assigned a control management category (DPIRD, 2021).

Table 6: Introduced Flora Species within the Survey Area

Species	Common Name	Status under BAM Act	WoNS
**Agave americana*	Century plant	Permitted - s11	No
**Asphodelus fistulosus*	Onion Weed	Permitted - s11	No
**Carrichtera annua*	Ward's Weed	Permitted - s11	No
**Centaurea melitensis*	Maltese Cockspur	Permitted - s11	No
**Crassula ovata*	Jade Tree	Permitted - s11	No

Species	Common Name	Status under BAM Act	WoNS
**Heliotropium europaeum*	Common Heliotrope	Permitted - s11	No
**Nicotiana glauca*	Tree Tobacco	Permitted - s11	No
**Oligocarpus calendulaceus*	-	Unlisted – s14	No
**Rumex vesicaria*	Ruby Dock	Unlisted – s14	No
**Salvia verbenaca*	Wild Sage	Permitted - s11	No
**Schinus molle* var. *areira*	-	Unlisted – s14	No
**Sonchus asper*	Rough Sowthistle	Permitted - s11	No
**Opuntia stricta*	Common Prickly Pear	Declared Pest - s22(2)	Yes

4.2.8 Unconfirmed Flora

Eighteen specimens (12.1% of the taxa recorded) could not be identified to species level because the taxa were sterile at the time of the survey (Appendix D). Of these, all but one, Malvaceae sp., were able to be identified to genus level, and two were assigned a tentative genus, ?*Enchylaena tomentosa* and ?*Pimelea* sp.

None of the unconfirmed flora taxa were analogous to Priority flora taxa identified by the database searches.

4.2.9 Vegetation Condition

The Survey Area has been subjected to medium to high level disturbances, including historical small and large scale mine excavations, makeshift tracks, cattle grazing, weeds, and litter. As such, vegetation condition with the Survey Area was predominantly Excellent, and ranged to Completely Degraded (where all vegetation had been completely cleared) (Keighery, 1994) (Table 7, Figure 7).

Table 7 Area (ha) covered by each vegetation condition category within the Survey Area

Vegetation Condition	Area (ha)	% of Survey Area
Excellent	790.6	58.1%
Very Good	327.9	21.2%
Good	78.4	5.8%
Completely Degraded	163.6	12%
Total	**1360.7**	**100**

4.2.10 Vegetation Types

Ten vegetation types were described and mapped across four broad landforms within the Survey Area (plains, rocky hills, claypan, and lake) (Table 8, Figure 8). The majority of the Survey Area was dominated by open plains with a mosaic of low *Eucalyptus* spp. (34.8%) which grew together across the plains, and Salmon Gum (*Eucalyptus salmonophloia*) open woodlands (31.4%). Small rocky hills dominated by *Acacia collegialis* shrubland also covered 13.1% of the Survey Area. While 11.5% of the Survey Area was considered to be 'Cleared', some of this was showing signs of revegetation with both native species (such as *Atriplex* and *Maireana*) and introduced (weed) species. These areas did not appear to have been intentionally revegetated.

Detailed data sheets for each flora site are provided in Appendix E.

Table 8: Vegetation Types Occurring within the Survey Area

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Photograph
AcEoaDl *Acacia collegialis* (*A. acuminata*) tall shrubland over *Eremophila oldfieldii* subsp. *angustifolia*, *E. georgei*, *A. tetragonophylla* (*Senna artemisioides* subsp. *filifolia*, *Exocarpos aphyllus*) mid shrubland over *Dodonaea lobulata* (*Atriplex vesicaria, Ptilotus obovatus* var. *obovatus*) low shrubland	Rocky hills	178.5 ha 13.1%	C1Q01, C1Q04, C1Q06, C1Q09, C1Q21, C1Q25, C1Q26, C1Q28, C1Q29, C1Q30, C1R04, C2Q07, C2Q09, C2Q14, C2Q18, C2Q32, C2Q33, C2Q34, C2Q35, C2Q38, C2Q40	
Ec *Eucalyptus celastroides* low woodland	Low slopes of rocky hills	7.4 ha 0.5%	C2Q43, C2R17	

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Photograph
EgAhSaf *Eucalyptus griffithsii* low open woodland over *Acacia hemiteles* and *Dodonaea stenozyga* (*A. jennerae, Alyxia buxifolia*) mid shrubland over *Senna artemisioides* subsp. *filifola* and *Atriplex vesicaria* (*Olearia muelleri*) low open shrubland	Plains	75.6 ha 5.6%	C1Q10, C1Q20, C1R13, C2Q27, C2Q29, C2Q31, C2Q41, C2Q50, C3Q01, C3Q02A, C3R01	
EooEiiDs *Eucalyptus oleosa* subsp. *oleosa* low open woodland over *Eremophila interstans* subsp. *interstans* mid isolated shrubs over *Dodonaea* stenozyga, *Eremophila glabra* subsp. *glabra*, and *Olearia muelleri* low open shrubland	Plains	11.1 ha 0.8%	C2Q11, C2Q37	

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Photograph
ErMhOm *Eucalyptus* ?*ravida* low open woodland over *Melaleuca* ?*hamata* (*M. pauperiflora* subsp. *fastigiata*, *Eremophila oppositifolia* subsp. *angustifolia*) tall open shrubland over *Olearia muelleri* low isolated shrubs	Plains	4.7 ha 0.3%	C2Q02, C2Q04, C2Q06	
EsEiiAv *Eucalyptus salmonophloia* mid open woodland over *Eremophila intertans* subsp. *interstans* (*Eremophila parvifolia* subsp. *auricampi*, *Senna artemisioides* subsp. *filifola*) tall to mid isolated shrubs over Atriplex vesicaria low open shrubland	Plains	428.0 ha 31.4%	C1Q03, C1Q22, C1Q23, C1Q24, C2Q12, C2Q19, C2Q20, C2Q21, C2Q24, C2Q26, C2Q28, C2Q46, C2Q52, C2Q54	

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Photograph
EsppEiiSaa *Eucalyptus salmonophloia* mid isolated trees over a mosaic of *E. celastroides, E. clelandiorum*, and *E. torquata* low open woodland over *Eremophila interstans* subsp. *interstans* (*Eremophila parvifolia* subsp. *auricampi*) mid isolated shrubs over *Senna artemisioides* subsp. *artemisioides*, *S. artemisioides* subsp. *filifola*, and *Atriplex vesicaria* low open shrubland	Plains, low hills	472.3 ha 34.8%	C1Q02, C1Q05, C1R05, C1R09, C1R10, C2Q01, C2Q03, C2Q05, C2Q08, C2Q10, C2Q13, C2Q15, C2Q16, C2Q36, C2Q39, C2Q42, C2Q45, C2R09, C3Q02, C3Q02B, C3Q06	
EtEaEpa *Eucalyptus torquata* low open woodland over *Exocarpos* aphyllus mid isolated shrubs over *Eremophila parvifolia* subsp. *auricampi*, *Westringia rigida*, and *Scaevola spinescens* (*Olearia muelleri*) low open shrubland	Plains, lower slopes of rocky hills	20.7 ha 1.5%	C1Q07, C1Q08, C1Q27, C1R01, C1R02, C1R03, C1R11	

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Photograph
SI *Streptoglossa liatroides* low open herbland	Clay	0.3 ha <0.1%	C2R44	
Lake Coolgardie Gorge, natural semi-permanent pool system, with a fringe of native and introduced flora taxa including *Eucalyptus spp.*, **Schinus molle* var. *areira*, **Helioptropium europaeum*, and **Sonchus asper.*	Lake system	5.6 ha 0.4%	C2R07	

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Photograph
Cleared Cleared or historically cleared areas including mine pits and borrow pits (often filled with water), bitumen roads, and dirt tracks. Some of these areas were showing signs of revegetation. With occasional *Eucalyptus griffithsii, Atriplex vesicaria*, *Maireana* spp., and assorted weed species.	Plains	156.9 ha 11.5%	C2Q17, C2Q25	

*Brackets indicate species that may or may not be present, but were observed as dominant/sub-dominant at some of the sites that make up the vegetation type

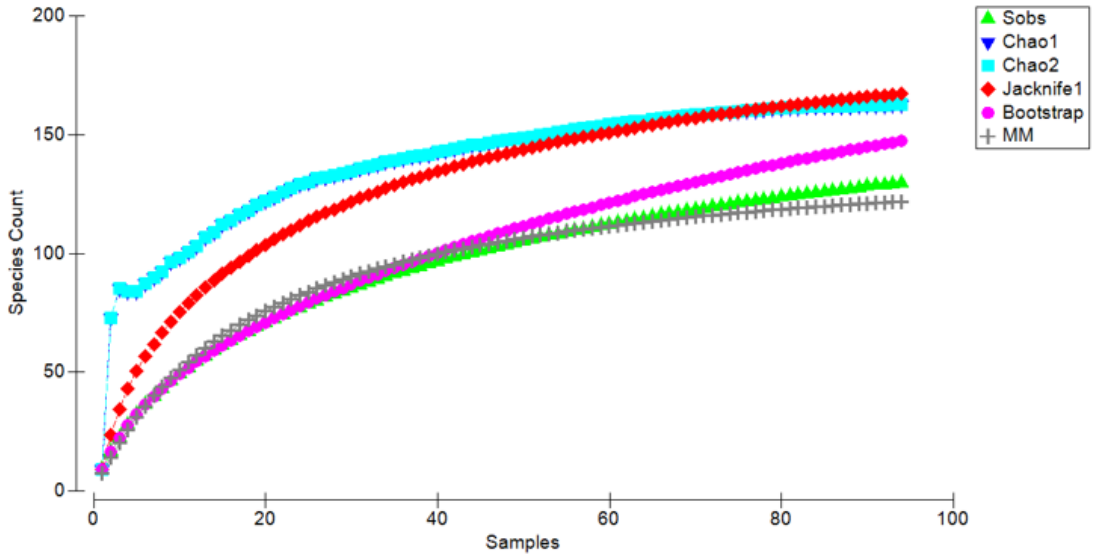
4.2.11 Groundwater Dependent Ecosystems

The Groundwater Depended Ecosystem (GDE) Atlas identified the Survey Area did not contain any GDEs (Bureau of Meteorology, 2022). The results from the flora and vegetation survey support the GDE Atlas as vegetation in the Survey Area comprised xerophytic species that are not groundwater dependent.

4.2.12 Survey Adequacy

Ninety-six flora sites (74 quadrats and 22 relevés) were sampled across the Survey Area. This was adequate to ensure sufficient coverage given the overall size of the Survey Area. Two vegetation types were sampled with only two sites, while a further two were sampled with a single site. This was due to the vegetation being highly restricted in the Survey Area.

The sample rarefaction (Mao Tau) for the Survey Area produced a smooth S_{obs} curve, steadily increasing towards asymptote indicating that the survey captured the majority of flora taxa present with the Survey Area (Graph 2).



Graph 2: Flora Species Accumulation Curve (Sample rarefaction)

Estimated species richness for the Survey Area ranged from 122.1 to 167.6, with an observed value of 130 taxa (Table 9). Richness estimators indicated that the survey was approximately 77.5% to 106.4% adequate in recording the full complement of vascular flora taxa within the Survey Area (Table 9).

The data used to produce the species accumulation curve was conservative because opportunistic species (which are not associated with a site) were not included. Unconfirmed flora taxa were included if they were the only species present from a Genus.

Table 9: Species Richness Indicators

Treatment	Expected Species Richness	Percentage Adequate
Chao 1	162.8	79.8
Chao 2	162.8	79.8
Jacknife 1	167.6	77.5
Bootstrap	147.6	88.0
Michaelis-Menton	122.14	106.4

4.3 Vertebrate Fauna

4.3.1 Desktop Assessment

The desktop assessment identified 20 conservation significant terrestrial vertebrate fauna species potentially occurring within the Survey Area, comprising 17 birds and three mammals.

Key findings of the literature review are summarized in Appendix A2. Database search results are presented in Figure 9 and Appendix B.

4.3.2 Fauna Habitat

Five broad fauna habitats were identified and mapped within the Survey Area (Figure 10). Habitat condition varied throughout the Survey Area with the most prolific forms of disturbance being previous mining activity, litter, and vehicle tracks. Other disturbances included clearing, erosion, weeds, and introduced fauna.

A description, extent within the Survey Area, and a representative photo is provided for each fauna habitat in Table 10. Small discrepancies in fauna habitat extents (i.e., not adding up to the exact area extent of the Survey Area) are due to rounding. Fauna habitat mapping is presented in Figure 10 and site sheets for each habitat assessment are shown in Appendix F.

Table 10: Fauna Habitat Types within the Survey Area

Fauna Habitat	Total Area, Proportion of the Survey Area	Habitat Description	Representative Photo
Acacia Shrublands	75.8 ha	*Eucalyptus griffithsii* low open woodland over *Acacia hemiteles* and *Dodonaea stenozyga (A. jennerae, Alyxia buxifolia)* mid shrubland over *Senna artemisioides* subsp. *filifola* and *Atriplex vesicaria (Olearia muelleri)* low open shrubland Hollow logs, leaf litter, and peeling bark are present throughout this habitat type. These microhabitat features provide shelter and foraging opportunities for small reptiles, birds, and mammals. Conservation significant fauna such as the Malleefowl (*Leipoa ocellata*) and the Western Quoll, Chuditch (*Dasyurus geoffroii fortis*) may use this habitat. Habitat condition varied from disturbed to very good. Evidence of disturbance includes previous mining activity, vehicle tracks, litter, and the presence of introduced fauna.	

Fauna Habitat	Total Area, Proportion of the Survey Area	Habitat Description	Representative Photo
Eucalyptus Woodlands	943.9 ha	Mixed *Eucalyptus* sp. woodlands over *Acacia* sp., *Dodonaea* sp., *Eremophila* sp. or *Melaleuca* sp., mixed shrublands. Peeling bark, woody debris, leaf litter and hollow logs were observed throughout this habitat type. These microhabitat features provide shelter for small reptiles and mammals. The canopy of trees provides shelter and foraging habitat for birds. Evidence of the conservation significant Western Quoll, Chuditch (*Dasyurus geoffroii fortis*) was recorded in this habitat type. The Malleefowl (*Leipoa ocellata*) may also use this habitat. Habitat condition varied from highly degraded to high quality. Evidence of disturbance includes previous mining activity, vehicle tracks, litter, and the presence of introduced fauna.	

Fauna Habitat	Total Area, Proportion of the Survey Area	Habitat Description	Representative Photo
Open Water	2.7 ha	Coolgardie Gorge was located within the Survey Area, with a fringe of introduced flora taxa including **Schinus molle* var. *areira*, **Helioptropium europaeum*, and **Sonchus asper.* Additional standing water was identified within remnant mine pits, however this may only be temporary. Microhabitats and habitat features unique to this habitat type include exfoliating rock, steep rocky crevices and water sources. Migratory birds such as the Common Sandpiper (*Actitis hypoleucos*), Sharp-tailed Sandpiper (*Calidris acuminata*), Curlew Sandpiper (*Calidris ferruginea*), Wood Sandpiper (*Tringa glareola*), Common Greenshank (*Tringa nebularia*) and Glossy Ibis (*Plegadis falcinellus*) may use these areas. Habitat condition varies from highly degraded to disturbed. Evidence of disturbance includes previous mining activity, vehicle tracks, litter, and the presence of introduced fauna.	

Fauna Habitat	Total Area, Proportion of the Survey Area	Habitat Description	Representative Photo
Rocky Slopes	178.5	*Acacia collegialis* (*A. acuminata*) tall shrubland over *Eremophila oldfieldii* subsp. *angustifolia*, *E. georgei*, *Acacia tetragonophylla* (*Senna artemisioides* subsp. *filifolia*, *Exocarpos* aphyllus) mid shrubland over *Dodonaea lobulata* (*Atriplex vesicaria, Ptilotus obovatus* var. *obovatus*) low shrubland Leaf litter, peeling bark, rock crevices, and woody debris provides shelter for small reptiles and mammals. Shrublands provide shelter and foraging habitat for birds, reptiles, and mammals. Malleefowl (*Leipoa ocellata*) may forage within this habitat, however, it is unlikely to nest in this habitat due to the rocky substrate. The Western Quoll, Chuditch (*Dasyurus geoffroii fortis*) may use this habitat. Habitat condition varies from disturbed to very good. Evidence of disturbance includes previous mining activities, vehicle tracks, litter, and the presence of introduced fauna.	

Fauna Habitat	Total Area, Proportion of the Survey Area	Habitat Description	Representative Photo
Cleared Areas	160.9 ha	Cleared or historically cleared areas including mine pits and borrow pits (often filled with water), bitumen roads, and dirt tracks. Areas of completely cleared land include vehicle access tracks and previous mining activity including mining pits. These areas have limited value as habitat for fauna. The mining pits may provide some habitat for small reptiles and mammals in the form of steep rocky crevices and isolated shrubs and grasses. Evidence of disturbance includes previous mining activity, vehicle tracks, litter, and the presence of introduced fauna.	

4.3.3 Fauna Records

The terrestrial vertebrate fauna survey recorded a total of 61 fauna taxa from 33 families. An inventory of fauna recorded during the field survey is provided in Appendix G.

Table 11: Overview of Vertebrate Fauna Species Recorded

Fauna group	Number of species	Number of families
Birds	42	21
Mammals	10	7
Reptiles	9	5
Amphibians	0	0
Total	**61**	**33**

4.3.3.1 Birds

A total of 42 avian taxa from 21 families were recorded throughout the Survey Area. The most recorded taxon was the Budgerigar (*Melopsittacus undulatus*), followed by the Australian Ringneck (*Platycercus zonarius*) and the Singing Honeyeater (*Gavicalis virescens*). The most diverse avifauna families were Meliphagidae (seven taxa) and Acanthizidae (six taxa).

4.3.3.2 Mammals

A total of three native mammals were recorded within the Survey Area. The most recorded native mammal taxon was the Western Grey Kangaroo (*Macropus fuliginosus melanops*). Seven introduced mammal taxa were recorded in the Survey Area, Goat (*Capra hircus*), European Cattle (*Bos primigenius taurus*), Dog/Dingo (*Canis familiaris*), Red fox (*Vulpes vulpes*), Horse (*Equus caballus*), Cat (*Felis catus*) and Rabbit (*Oryctolagus cuniculus*).

4.3.3.3 Reptiles

A total of nine reptilian species from five families were recorded throughout the Survey Area. The most recorded species was the Bobtail (*Tiliqua rugosa*) followed by the Bynoe's Gecko (*Heteronotia binoei*). The most diverse reptilian family was Agamidae (four taxa).

4.3.3.4 Amphibians

No amphibians were recorded during the field survey.

4.3.4 Conservation Significant Fauna

One conservation significant taxon was recorded via observation of a scat during the fauna survey, the Western Quoll, Chuditch (*Dasyurus geoffroii fortis*), which is listed Vulnerable under the BC and EPBC Act (Plate 2).

Plate 2: Scat of Western Quoll, Chuditch (*Dasyurus geoffroii fortis*)

GPS Coordinates: Latitude: -30.920324, Longitude: 121.184610. Image Source 360 Environmental.

Three conservation significant fauna taxa were assessed as having a high likelihood of occurrence within the Survey Area:

- Malleefowl (*Leipoa ocellata*), Vulnerable under the BC and EPBC Act
- Common Sandpiper (*Actitis hypoleucos*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act
- Common Greenshank (*Tringa nebularia*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act.

Four conservation significant taxa were assessed as having a medium likelihood of occurrence within the Survey Area:

- Sharp-tailed Sandpiper (*Calidris acuminata*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act
- Curlew Sandpiper (*Calidris ferruginea*), Critically Endangered, International Agreement under the BC Act and Critically Endangered, Migratory and Marine under the EPBC Act

- Wood Sandpiper (*Tringa glareola*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act
- Glossy Ibis (*Plegadis falcinellus*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act.

Twelve conservation significant taxa were assessed as having a low likelihood of occurrence within the Survey Area. Further details regarding recorded and potential conservation significant fauna are provided below in Table 12.

Table 12: Conservation Significant Fauna Likelihood of Occurrence

Conservation Status: State - Listed under Biodiversity Conservation Act 2016 or Department of Biodiversity, Conservation and Attractions Conservation List, Federal - Listed under Environmental Protection and Biodiversity Conservation Act 1999. CR - Critically Endangered, EN - Endangered, VU - Vulnerable, IA/MI - Migratory, CD - Conservation Dependent fauna, OS - Other Specially Protected fauna, MA - Marine, P - Listed as Priority by DBCA.

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
AVIAN											
Apodidae	*Apus pacificus*	Pacific Swift (Fork-tailed Swift)	IA	MI, MA		x				Low	Three records within 100 km on the Survey Area (Atlas of Living Australia, 2022a). Species may fly over the Survey Area as it covers a wide range of airspace over varied habitat (Morcombe, 2003).
Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's Cockatoo	EN	EN	x		x	4		Low	This species was recorded 30 km NE of the Survey Area in Kalgoorlie (Department of Biodiversity Conservation and Attractions, 2021c). However, these records occur well outside the known distribution of the species and likely represent a vagrant occurrence of the taxon (Department of Sustainability

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
											Environment Water Population and Communities, 2012).
Charadriidae	*Thinornis cucullatus*	Hooded Plover (Hooded Dotterel)	P4	MA			x			Low	Closest record 42 km NE of the Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). No suitable habitat within the Survey Area (Menkhorst *et al.*, 2017).
Falconidae	*Falco hypoleucos*	Grey Falcon	VU	VU		x				Low	No recent nearby records. Some records within 100 km on the Survey Area (Atlas of Living Australia, 2022b). Preferred nesting habitat absent. May use Survey Area for hunting (Menkhorst *et al.*, 2017).
Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU	x	x	x	79		High	Recent records within 1 km of the Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). Recorded 40 km north of the Survey Area in 2019 (Phoenix

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
											Environmental Sciences, 2019). Suitable habitat present, unburned mallee and woodland with abundant litter and low scrub (Morcombe, 2003)
Motacillidae	*Motacilla cinerea*	Grey Wagtail	IA	MI, MA		x				Low	Survey Area is well outside of the distribution of this species Area (Atlas of Living Australia, 2022b). Some suitable habitat present in parts i.e. water bodies (Morcombe, 2003).
Psittaculidae	*Pezoporus occidentalis*	Night Parrot	CR	EN		x				Low	No records within 100 km on the Survey Area (Atlas of Living Australia, 2022b). No suitable habitat within the Survey Area (Morcombe, 2003).
Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	IA	MI, MA	x	x	x	3		Previously Recorded	Three recent records within the Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). Some suitable habitat present i.e. interior wetlands – narrow muddy edges of billabongs (Morcombe, 2003).

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
Scolopacidae	*Calidris acuminata*	Sharp-tailed Sandpiper	IA	MI, MA	x	x	x	2		Medium	Nearest record 15 km NW of the Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). Suitable habitat present (water bodies) (Morcombe, 2003).
Scolopacidae	*Calidris alba*	Sanderling	IA	MI, MA	x		x	1		Low	Nearest record in Kalgoorlie (Department of Biodiversity Conservation and Attractions, 2021c). No suitable habitat within the Survey Area (Menkhorst et al., 2017).
Scolopacidae	*Calidris ferruginea*	Curlew Sandpiper	CR, IA	CR, MI, MA	x	x	x	1		Medium	Nearest record 15 km NW of Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). Suitable habitat within the Survey Area i.e. around lakes, dams (Morcombe, 2003).
Scolopacidae	*Calidris melanotos*	Pectoral Sandpiper	IA	MI, MA		x				Low	Survey Area is well outside of the distribution of this species Area (Atlas of Living Australia, 2022b). Some suitable habitat present in parts i.e. inland

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
											water bodies (Morcombe, 2003).
Scolopacidae	*Calidris ruficollis*	Red-necked Stint	IA	MI, MA	x		x	1		Low	Nearest record 15 km NW of Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). No suitable habitat within the Survey Area i.e., mudflats (Morcombe, 2003).
Scolopacidae	*Tringa brevipes*	Grey-tailed Tattler	IA, P4	MI, MA	x		x	1		Low	Nearest record 20 km NE of Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). No suitable habitat within the Survey Area, coastal in Australia (Menkhorst et al., 2017).
Scolopacidae	*Tringa glareola*	Wood Sandpiper	IA	MI, MA	x		x			Medium	Nearest record 30 km NE of the Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). Suitable habitat within the Survey Area i.e., freshwater

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
											wetlands (Menkhorst et al., 2017).
Scolopacidae	*Tringa nebularia*	Common Greenshank	IA	MI, MA	x	x	x	2		Previously Recorded	Recent record within the Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). Suitable habitat within the survey areas i.e. temporary inland wetlands (Morcombe, 2003).
Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis	IA	MI, MA			x			Medium	Only record 27 km NE of the Survey Area in Kalgoorlie (Department of Biodiversity Conservation and Attractions, 2021c). Some suitable habitat present i.e. temporary wetlands (Morcombe, 2003).
MAMMALIAN											
Dasyuridae	*Dasyurus geoffroii fortis*	Western Quoll, Chuditch	VU	VU		x	x		x	**Recorded**	A scat was found within the Survey Area during the current survey, identified to be this species. Some suitable habitat present mallee

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
											shrubland (Van Dyck and Strahan, 2008).
Myrmecobiidae	*Myrmecobius fasciatus*	Numbat, Walpurti	EN	EN	x					Low	No nearby records (Atlas of Living Australia, 2022b). Some suitable habitat is present i.e. eucalypts and wandoo woodland (Van Dyck and Strahan, 2008). The only natural populations exist well outside the Survey Area in the far north of WA (Department of Biodiversity Conservation and Attractions, 2017b).
Thylacomyidae	*Macrotis lagotis*	Bilby, Dalgyte	VU	VU	x					Low	No nearby records (Atlas of Living Australia, 2022b). No suitable habitat is present (Van Dyck and Strahan, 2008).
INSECTS											
Lycaenidae	*Jalmenus aridus*	Inland Hairstreak	P1 (not WAM)		x		x			Medium	Nearest record 19 km NE of the Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). Suitable habitat present within the Survey Area

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
											(Williams, Williams and Lundstrom, 1998)
Lycaenidae	*Ogyris subterrestris petrina*	Arid Bronze Azure Butterfly	CR (not WAM)	CR (not WAM)	x	x	x			Medium	No recent records (Department of Biodiversity Conservation and Attractions, 2021c). Suitable habitat present (smooth bark *Eucalyptus* sp.) (Department of Biodiversity Conservation and Attractions, 2020b).

5 Discussion

5.1 Flora and Vegetation

5.1.1 Flora Composition

The suite of flora taxa recorded during the survey is considered typical for the area (Beard 1976) and aligns with the database search results obtained and with previous surveys conducted around the Survey Area.

5.1.2 Survey Adequacy

The flora and vegetation survey effort was in accordance with the scope of works, and appropriate for a detailed flora and vegetation survey in the Eastern Goldfields region.

The Survey Area was sampled with 74 quadrats, 22 relevés and an additional 91 mapping notes. Of the 10 vegetation types defined, four were not sampled with three flora sites. Vegetation types Ec and EooEiiDs were sampled with two sites only due to limited distribution of the vegetation (<1% each). Vegetation types Sl, and Lake were sampled only once due to the landforms (clay and lake) being very limited in distribution.

The inventory of vascular flora was compiled using site data and opportunistic observations made while traversing between sites and during targeted searching within the Survey Area. The entire Survey Area was not systematically searched, and therefore additional flora taxa, and records of conservation significant flora and weed species may be recorded with additional survey effort.

5.1.3 Flora of Conservation Significance

No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened Flora pursuant to the BC Act 2016 were recorded within the Survey Area.

Ten individuals of *Austrostipa blackii* (P3) were recorded from quadrat C1Q01, within vegetation type AcEoaDl. This vegetation type was sampled heavily, and no other records of the taxon were recorded. With more intensive surveys additional individuals may be recorded, as this vegetation type and landform (rocky hills) cover 13.1% of the Survey Area.

5.1.4 Likelihood of Occurrence

Of the 90 Priority flora identified by the database searches, only one was recorded from the Survey Area (*Austrostipa blackii* (P3)). Of the remaining 89 taxa, two were considered to retain a high likelihood of occurrence following the survey:

- *Acacia websteri* (P1): A tall shrub or tree is known only from the Bencubbin and Coolgardie-Kambalda areas, and grows mostly in red loam, sand, and clay in drainage depressions among shrubland and scrub. The habitat for this taxon is present within the Survey Area, and the closest location is <1 km from the survey boundary.

- *Eremophila veronica* (P3): A record of this erect shrub to 40cm high (80cm wide) was located 500 m from the Survey Area, in vegetation similar in appearance to that within the survey boundary. The record was noted as growing with *E. salubris, A. burkittii*, and *Cylindropuntia tunicata*.

A further 18 taxa were considered to have a medium likelihood of occurrence due to presence of habitat and records within 15 km of the Survey Area boundary. The remaining taxa were considered to have a low likelihood of occurrence.

5.1.5 Introduced Flora

Thirteen weed species were recorded in the Survey Area, of which one, **Opuntia stricta* (Common Prickly Pear), is a Declared Pest and listed as a WoNS.

Weed diversity and population abundance are consistent with the region and land use (mining operations, broadacre cropping and sheep farming).

Weed species richness and abundance was greatest in previously cleared areas such as old drill pads/ excavation works and associated tracks. Weed species, particularly **Opuntia stricta* were present in relatively high abundance near Great Eastern Highway. The publicly accessible semi-pool 'Coolgardie Gorge' contained dense weed numbers along the edge and in the immediate surrounds.

5.1.6 Unconfirmed Flora

Eighteen specimens collected during the field survey were sterile and could not be confidently identified beyond genus level. None of these were analogous to Priority flora taxa identified by the database searches.

5.1.7 Vegetation Types

No vegetation representative of any TECs or PECs was recorded in the Survey Area.

Mapping reliability across the survey area was high, and the majority of the Survey Area was traversed on foot. The plains through the majority of the Survey Area showed a mosaic of different *Eucalyptus* spp. that could not be easily separated via quadrating or aerial imagery. However, *E. salmonophloia* was scattered across the majority of the plains, with *E. celastroides, E. clelandiorum*, and *E. torquate* at varying densities across the plains. This is common across the region, as underlying geology affects the vegetation on a fine scale. The Survey Area was dominated by these plains, along with rocky hills dominated by *Acacia collegialis* tall shrubs. While this vegetation type AcEoaDl rocky hills did support *Austropstipa blackii* (P3), only one population was recorded through 21 quadrats in the vegetation. As such it was not considered to be a distinctive habitat of the taxon, and not considered to be vegetation of local significance.

Coolgardie Gorge is a natural semi-pool landform present within the Survey Area, which is also a public recreation area, as such it contains many introduced (weed) taxa. The landform is limited in size, with the vegetation unique and restricted to a small radius around the semi-pool.

Numerous patches within the Survey Area were considered either recently or historically cleared. Some of these historically cleared areas contained some regrowing native and weed taxa, however, were still considered to be cleared as they were predominantly bare, and any native taxa did not represent the surrounding vegetation. One small area of claypan vegetation was recorded and sampled with a single quadrat. After recent rains, this claypan landform may contain an increased load of annual and cryptic taxa.

5.2 Vertebrate Fauna

5.2.1 Fauna Habitat

The five broad fauna habitats identified within the Survey Area are typical of the Coolgardie bioregion and consistent with habitats identified by previous studies in the region (Terrestrial Ecosystems, 2018; Phoenix Environmental Sciences, 2019; Strategen Environmental, 2019; Biostat Pty Ltd, 2020). Of the habitats within the Survey Area, the *Eucalyptus* Woodlands, *Acacia* Shrublands and Open Water habitats, particularly the semi-permanent pool at Coolgardie Gorge, represent the most value to the overall fauna assemblage within the Survey Area. The *Eucalyptus* Woodlands and the *Acacia* Shrubland habitats are valuable due to the variety of micro habitats present. Peeling bark, woody debris, leaf litter and hollow logs were observed throughout these habitat types. The dense understorey observed in these habitat types may provide refuge and shelter for a variety of mammals, reptiles, and birds. Specifically, these habitat types may provide suitable breeding and nesting habitat for the Malleefowl (*Leipoa ocellata*) and foraging habitat for the Western Quoll, Chuditch (*Dasyurus geoffroii fortis*).

The Open Water habitat provides an important water source for fauna within the Survey Area and is particularly important for water birds, including several significant species. The Open Water habitat at Coolgardie Gorge is surrounded by vegetation that provides potential foraging, roosting, and nesting habitat for a wide variety of fauna taxa. Old mine pits throughout the Survey Area may have water present, however it will be of less value to most fauna species due to a lack of surrounding vegetation.

The Rocky Slopes habitat contains crevices that may provide refuge and shelter for small fauna taxa. This habitat type generally lacks the dense understory found in the *Eucalyptus* Woodlands and the *Acacia* Shrubland habitats, making it less suitable for the Malleefowl and its slope reduces its value as Malleefowl nesting habitat.

Cleared Areas provide limited habitat value for fauna; however, some small mammals and reptiles may use the rocky crevices within the steep walls of mining pits and the low isolated shrubs occasionally found in other Cleared Areas for shelter and foraging.

The habitat condition varied widely throughout the Survey Area from highly degraded to high quality. The most common forms of disturbance included previous mining activity, litter, and vehicle tracks. Species with a limited dispersal capability may be restricted by these impacts, whilst movements of birds, larger reptiles, and mammals between surrounding habitats are unlikely to be severely impeded by these disturbances.

5.2.2 Conservation Significant Fauna

5.2.2.1 Recorded

Western Quoll, Chuditch (*Dasyurus geoffroii fortis*), Vulnerable under the BC Act and EPBC Act

The Chuditch inhabits areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland (Van Dyck and Strahan, 2008). The species is generally highly mobile and uses bush remnants as corridors (Woinarski, Burbidge and Harrison, 2014). The Chuditch is a largely nocturnal animal, feeding on a carnivorous diet of mammals, birds, lizards, and frogs. Although they have been recorded foraging during the day at particular times such as during the breeding season or when cold and wet weather restricts their nocturnal movements (Van Dyck and Strahan, 2008). Most diurnal nesting sites in sclerophyll forest consist of hollow logs or earth burrows, although bandicoot nests and hollow tree bases may be used (Van Dyck and Strahan, 2008). The Chuditch was abundant prior to European settlement, and it is now largely restricted to the south-west of Western Australia, with small numbers in the Midwest, Wheatbelt and South Coast regions (Department of Biodiversity Conservation and Attractions, 2017a).

Chuditch scat was recorded within the Survey Area. Of the habitat types present with the Survey Area the *Eucalyptus* Woodland and *Acacia* Shrubland present the most value to this species. These habitats contain mallee woodland and shrubland, which the Chuditch often inhabits as well hollow logs and tree bases which are used for denning (Van Dyck and Strahan, 2008). The suitability of these habits likely varies with the degree of disturbance which may alter prevalence of both denning sites and availability of prey.

5.2.2.2 High Likelihood

Malleefowl (*Leipoa ocellata*), Vulnerable under the BC Act and EPBC Act

The Malleefowl is found in semi-arid to arid shrublands and low woodlands, especially those dominated by mallee and/or *Acacia*. The species nests in large mounds of dirt and leaf litter up to five metres wide and one metre tall (Menkhorst et al., 2017). Sandy substrates and abundance of leaf litter are required for breeding (Department of the Environment and Energy, 2018). Densities of the birds are generally greatest in areas of higher rainfall and on more fertile soils where there is an abundance of food plants.

The Malleefowl has recently been recorded within 1 km of the Survey Area and is therefore highly likely to use suitable habitat within the Survey Area (Department of Biodiversity Conservation and Attractions, 2022). The *Eucalyptus* Woodland and *Acacia* Shrubland habitats constitute suitable habitat for the taxon. No mounds, tracks, or other signs of the taxon observed during the field survey. When present, these signs are obvious and detectable (National Malleefowl Recovery Team, 2016). While breeding may occur in the Survey Area, it is unlikely that high densities of breeding individuals are present.

Common Sandpiper (*Actitis hypoleucos*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act.

The Common Sandpiper typically feeds on mollusks and crustaceans as well as a variety of insects. It is a migratory species that uses varied coastal and interior wetlands including narrow muddy edges of billabongs, river pools, mangroves, among rocks and snags, reefs or rocky beaches (Morcombe, 2003). It migrates from mid-northern latitudes of Asia (Menkhorst *et al.*, 2017) and likely breeds in the Russian far east (Pizzey and Knight, 2001).

The Common Sandpiper was not recorded during the current field survey, however it has been recorded within the Survey Area previously (Department of Biodiversity Conservation and Attractions, 2022). The taxon may use the Open Water habitat within the Survey Area, particularly the Coolgardie Gorge for foraging and roosting.

Common Greenshank (*Tringa nebularia*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act.

The Common Greenshank is a migratory species to Australia that typically breeds in Norway (BirdLife International, 2016). The species is found in a wide variety of wetlands from coastal to freshwater, where it wades in shallow water foraging for prey, often lunging or probing for fish and invertebrates (Pizzey and Knight, 2001; BirdLife International, 2016; Menkhorst *et al.*, 2017).

The Common Greenshank was not recorded during the current field survey, however, it has been recorded within the Survey Area previously (Department of Biodiversity Conservation and Attractions, 2022). The taxon may use the Open Water habitat within the Survey Area, particularly the Coolgardie Gorge for foraging and roosting.

5.2.2.3 Medium Likelihood

Sharp-tailed Sandpiper (*Calidris acuminata*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act.

The Sharp-tailed Sandpiper is a small-medium migratory wader, nesting in the northern Siberian Tundra and is one of the most common shorebirds to inhabit in fresh and saline wetlands occurring inland in Australia (Menkhorst *et al.*, 2017). In Western Australia there are scattered records of the species occurring along the Nullarbor Plain and the southern areas of the Great Victoria Desert. They are widespread from Cape Arid to Carnarvon, around coastal and subcoastal plains of the Pilbara Region to south-west and east Kimberley (Pizzey and Knight,

2001). It also forages in grasslands and tidal areas. The species typically prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation (Pizzey and Knight, 2001).

The Sharp-tailed Sandpiper was not recorded during the field survey. The nearest record was 15 km northwest of the Survey Area (Department of Biodiversity Conservation and Attractions, 2022). The taxon may use the Open Water habitat within the Survey Area, particularly the Coolgardie Gorge for foraging and roosting.

Curlew Sandpiper (*Calidris ferruginea*), Critically Endangered, International Agreement under the BC Act and Critically Endangered, Migratory and Marine under the EPBC Act.

The Curlew Sandpiper is a small, slim sandpiper that is most commonly found on large tidal flats, occasionally using brackish and freshwater wetland systems (Menkhorst *et al.*, 2017). They typically forage on invertebrates throughout mudflats and nearby shallow water. The species is migratory and nests in Arctic Siberia, and in Western Australia are widespread around coastal and subcoastal plains from Cape Arid to the south-west Kimberley (Pizzey and Knight, 2001).

The Curlew Sandpiper was not recorded during the field survey. The nearest record was 15 km northwest of the Survey Area (Department of Biodiversity Conservation and Attractions, 2022). The taxon may use the Open Water habitat within the Survey Area, particularly the Coolgardie Gorge for foraging and roosting.

Wood Sandpiper (*Tringa glareola*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act.

The Wood Sandpiper is a small, thin wader that uses well-vegetated, shallow, freshwater wetlands such as swamps, billabongs, lakes, pools and waterholes (Menkhorst *et al.*, 2017). The species is generally associated with emergent aquatic plants or grass, and they forage on moist or dry mud at the edges of wetlands. The Wood Sandpiper is a migratory species, breeding in the subarctic Siberia with some individuals migrating to Australia (Menkhorst *et al.*, 2017). In Western Australia the species is widespread but scattered in most regions (Pizzey and Knight, 2001).

The Wood Sandpiper was not recorded during the field survey. The nearest record was 30 km northeast of the Survey Area (Department of Biodiversity Conservation and Attractions, 2022). The taxon may use the Open Water habitat within the Survey Area, particularly the Coolgardie Gorge for foraging and roosting.

Glossy Ibis (*Plegadis falcinellus*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act.

The preferred foraging and breeding habitat of the Glossy Ibis includes fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation (Marchant and Higgins, 1990; del Hoyo, Elliot and Sargatal, 1992). The Glossy Ibis builds a platform nest of sticks in trees or shrubs above

water and typically nests in colonies (Pizzey and Knight, 2013). The distribution of the Glossy Ibis is generally east of the Kimberley in Western Australia and Eyre Peninsula in South Australia. The species is also known to be patchily distributed in the rest of Western Australia (Department of the Environment and Energy, 2020).

The Glossy Ibis was not recorded during the field survey, however, it has been recorded 27 km northeast of the Survey Area in Kalgoorlie (Department of Biodiversity Conservation and Attractions, 2022). The taxon may use the Open Water habitat within the Survey Area, particularly the Coolgardie Gorge for foraging and roosting.

5.3 Invertebrates

Although outside the scope of this report, two conservation significant invertebrates were identified as potentially occurring within the Survey Area.

Arid Bronze Azure Butterfly (*Ogyris subterrestris petrina*), Critically Endangered under the BC Act and EPBC Act.

Following the extirpation of the only known population in the early 1990s, the Arid Bronze Azure Butterfly (ABAB) was rediscovered at Barbalin Nature Reserve in 2006. The ABAB can only reproduce where nests of the sugar ant, *Camponotus* sp. nr. *terebrans* are present. The ants protect the larvae from predators and in return, the ants feed on secretions produced by the ABAB larvae. Unlike other species in this genus, the ABAB larva do not eat vegetation and are entirely dependent upon the host ant. The ABAB larvae require large ant colonies that are typically found at the base of many species of smooth-barked eucalypts including *Eucalyptus salubris* and *E. salmonophloia* (Department of Biodiversity Conservation and Attractions, 2020b).

The presence of multiple smooth-barked eucalypt species within the known distribution of the host ant *Camponotus* sp. nr. *terebrans* suggests that suitable habitat for the ABAB may occur within the survey area. The presence of potentially suitable ABAB habitat within the range of the host ant requires surveys to determine the presence and density of *Camponotus* sp. nr. *terebrans* colonies (Department of Biodiversity Conservation and Attractions, 2020a, 2020b). Consequently, a targeted survey for host ant colonies was conducted in Dec 2021. The results of this survey are presented in a separate report in preparation (360 Environmental 2022, in prep).

Inland Hairstreak (*Jalmenus aridus*), Priority 1 under the BC Act.

Jalmenus aridus is one of ten currently recognised species in the genus *Jalmenus*, which is found only in Australia. *Jalmenus* species feed openly on the foliage of their respective host plants, and all are attended by specific ant species. *Jalmenus aridus* is attended by the ant species *Froggattella kirbii* (Sands and New, 2002). *Jalmenus aridus* is protected by the ants from predators and parasitoids and the butterfly caterpillars reward the ants with sweet liquid produced in special organs.

The butterfly is only present in its adult form for short periods of time (perhaps only two to three weeks at a given site). Timing of adult emergence is linked to rainfall patterns, plant growth stages and other ecological conditions with most likely flight times from mid-October to mid-November.

The ant, *Froggattella kirbii* is found from near Perth to the East coast of Australia ad is associated with two known host plants. One host plant, *Senna nemophila* (*artemisioides*), is found over most of central and eastern WA while the other known host plant, *Acacia tetragonophylla,* is found almost everywhere in WA except the very far north and far south.

During the surveys, it was observed that suitable habitat was present within the Survey Area. Additional targeted surveys will be required to confirm the presence of *Jalmenus aridus* within the Survey Area.

6 Conclusion

Flora and Vegetation

- No Threatened Listed flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act 2016 were recorded
- Ten individuals of *Austrostipa blackii* (P3), were recorded in one quadrat (C1Q01)
- Thirteen introduced species were recorded during the survey, of which one, **Opuntia stricta*, is a Declared Pest and listed as a WoNS
- Ten vegetation types were mapped within the Survey Area, none of which were analogous to conservation significant ecological communities.

Vertebrate Fauna

- Five fauna habitats were mapped, of which the *Eucalyptus* Woodland, *Acacia* Shrubland, and Open Water habitat types represent the most value to conservation significant fauna and overall fauna assemblages. A naturally occurring pool at Coolgardie Gorge was of particularly value to water birds and to the overall fauna assemblage.
- One conservation significant species, the Western Quoll, Chuditch (*Dasyurus geoffroii fortis*), which is listed as Vulnerable under the BC Act and EPBC Act, was recorded within the Survey Area. Chuditch scat was observed during the field survey.
- Seven introduced species were recorded during the survey, Goat (*Capra hircus*), European Cattle (*Bos primigenius taurus*), Dog/Dingo (*Canis familiaris*), Red fox (*Vulpes vulpes*), Horse (*Equus caballus*), Cat (*Felis catus*) and Rabbit (*Oryctolagus cuniculus*).
- One significant fauna species, the Western Quoll, Chuditch (*Dasyurus geoffroii fortis*) which is listed as Vulnerable under the BC Act and EPBC Act, was recorded within the Survey Area based on a scat observed during the field survey.
- Although outside the scope of this report, potential habitat for Arid Bronze Azure Butterfly (*Ogyris subterrestris petrina*), which is listed as Critically Endangered under the BC Act and EPBC Act, and the Inland Hairstreak butterfly (*Jalmenus aridus*), which is listed as Priority 1 by the DBCA, was observed within the Survey Area.

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It is important to recognise that site conditions, including the extent and concentration of contaminants, can change with time. This is particularly relevant if this report, including the data, opinions, conclusions, and recommendations it contains, are to be used a considerable time after it was prepared. In these circumstances, further investigation of the site may be necessary.

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8 References

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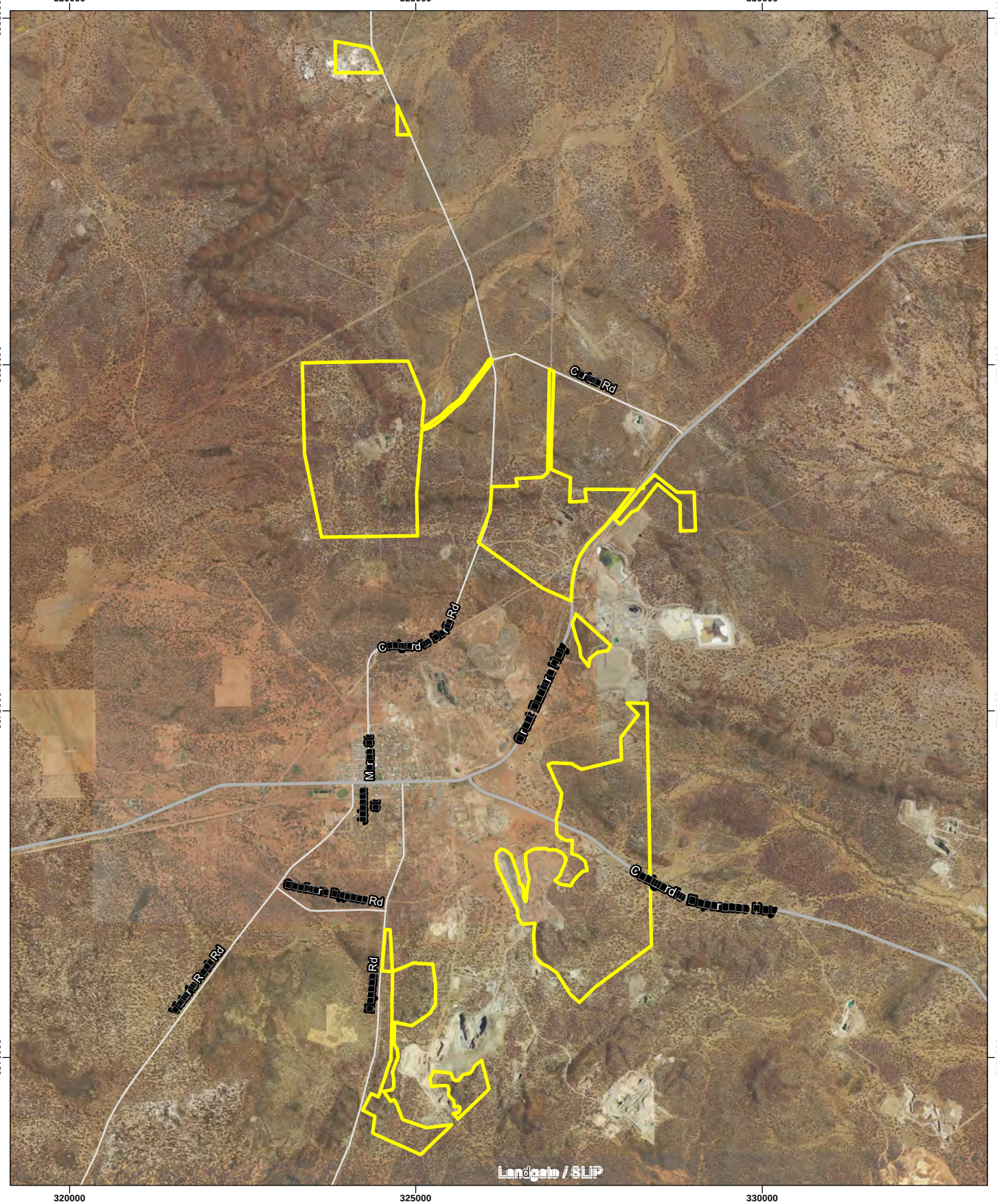
Figures



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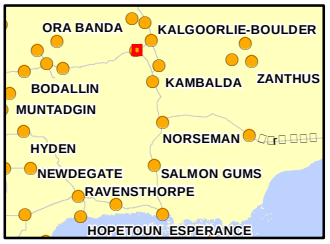

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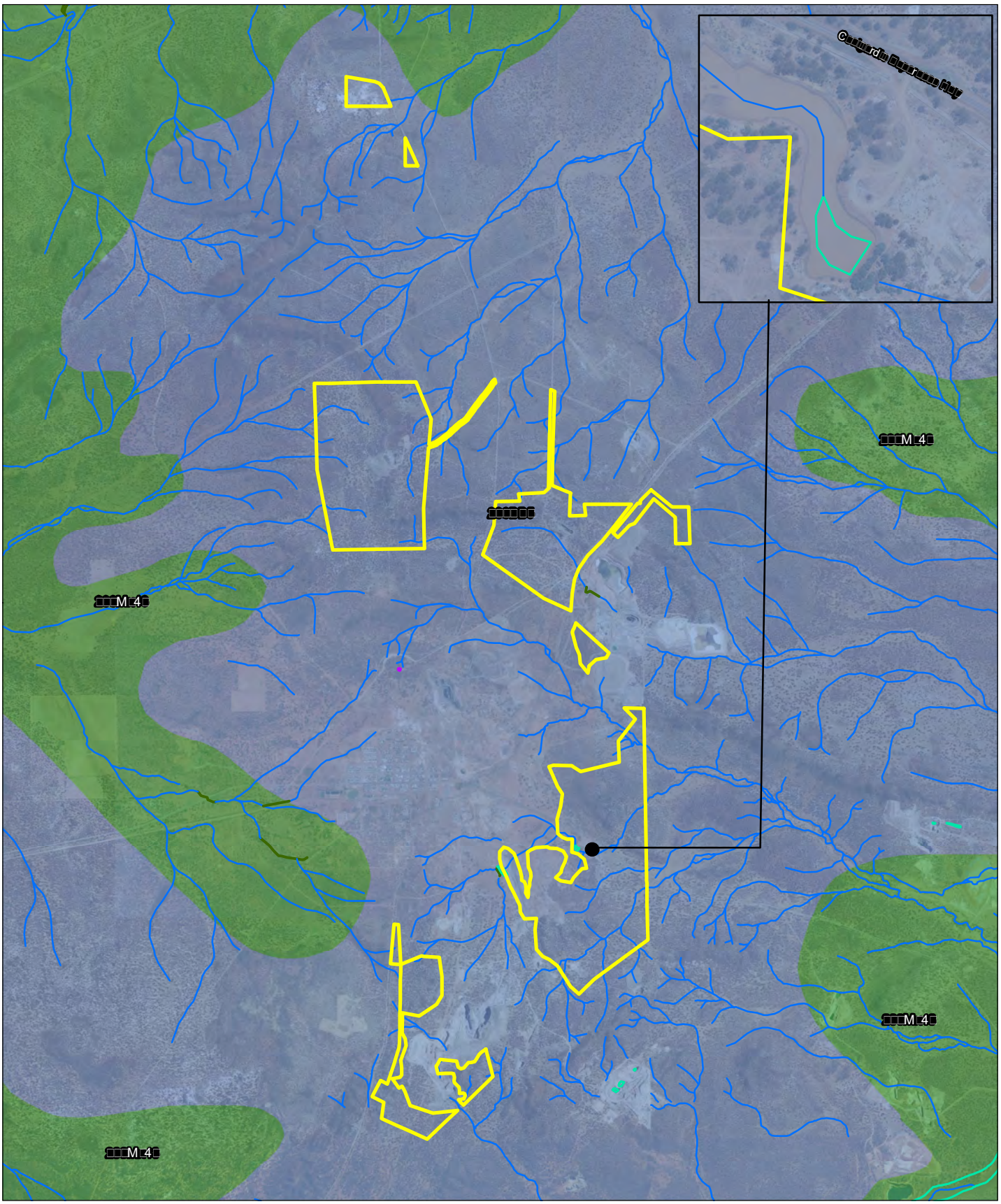

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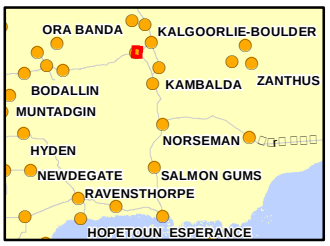

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Figure 2

Soil Landscapes and Land Systems and Hydrography

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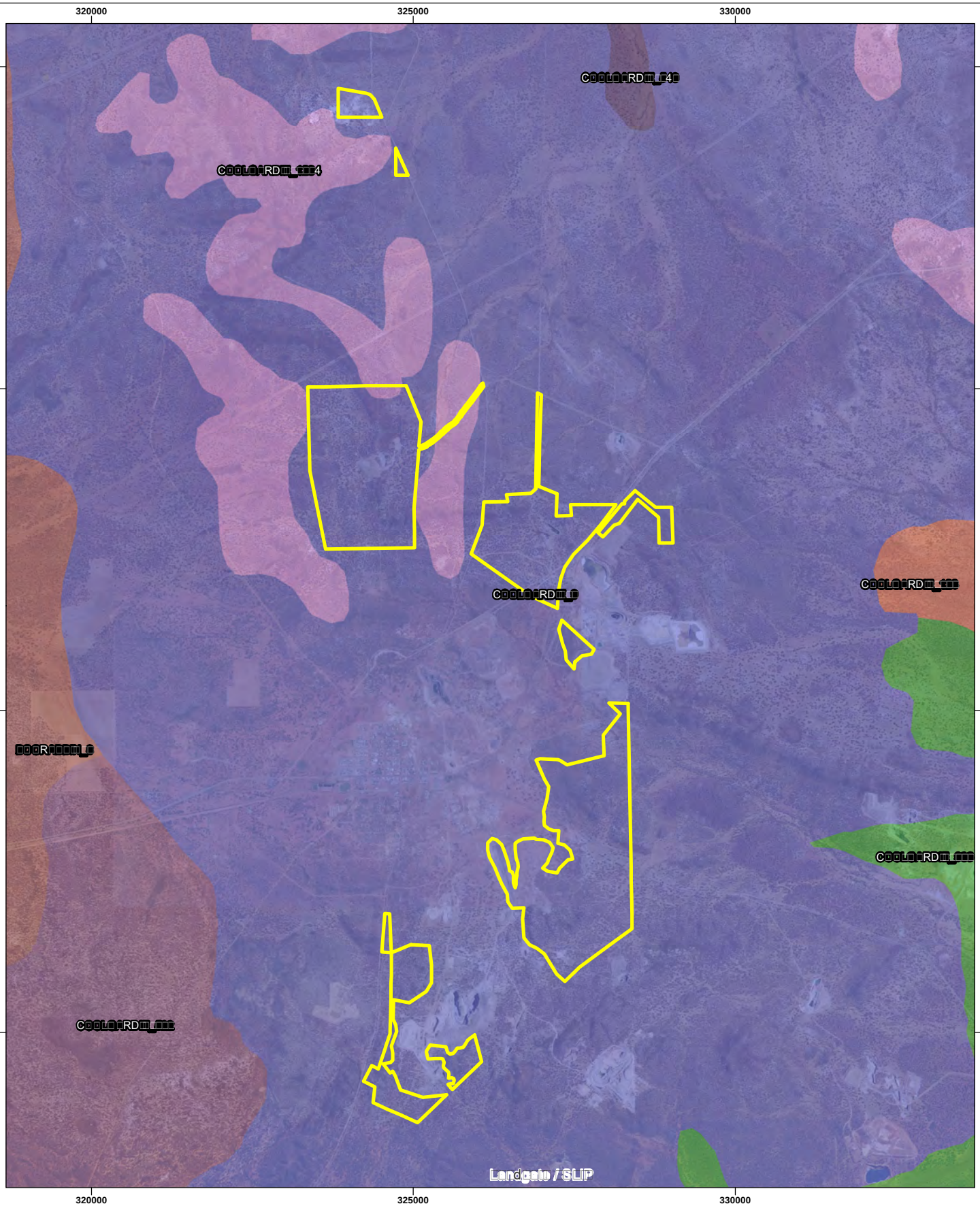

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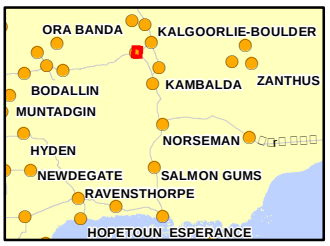

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Figure 3
Broad Vegetation Types

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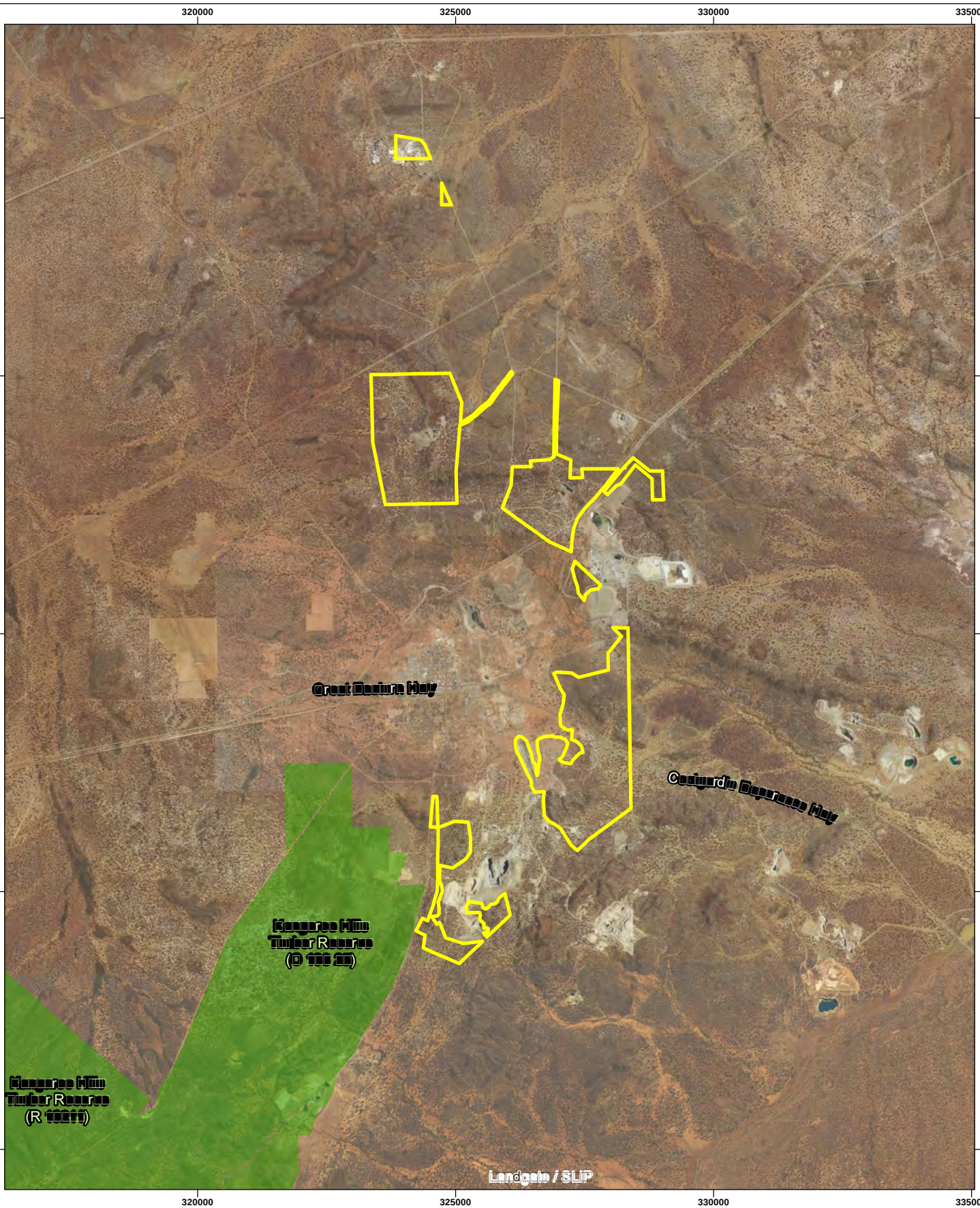

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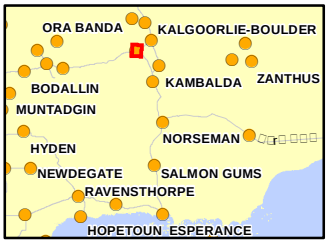

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Figure 4

Conservation Areas

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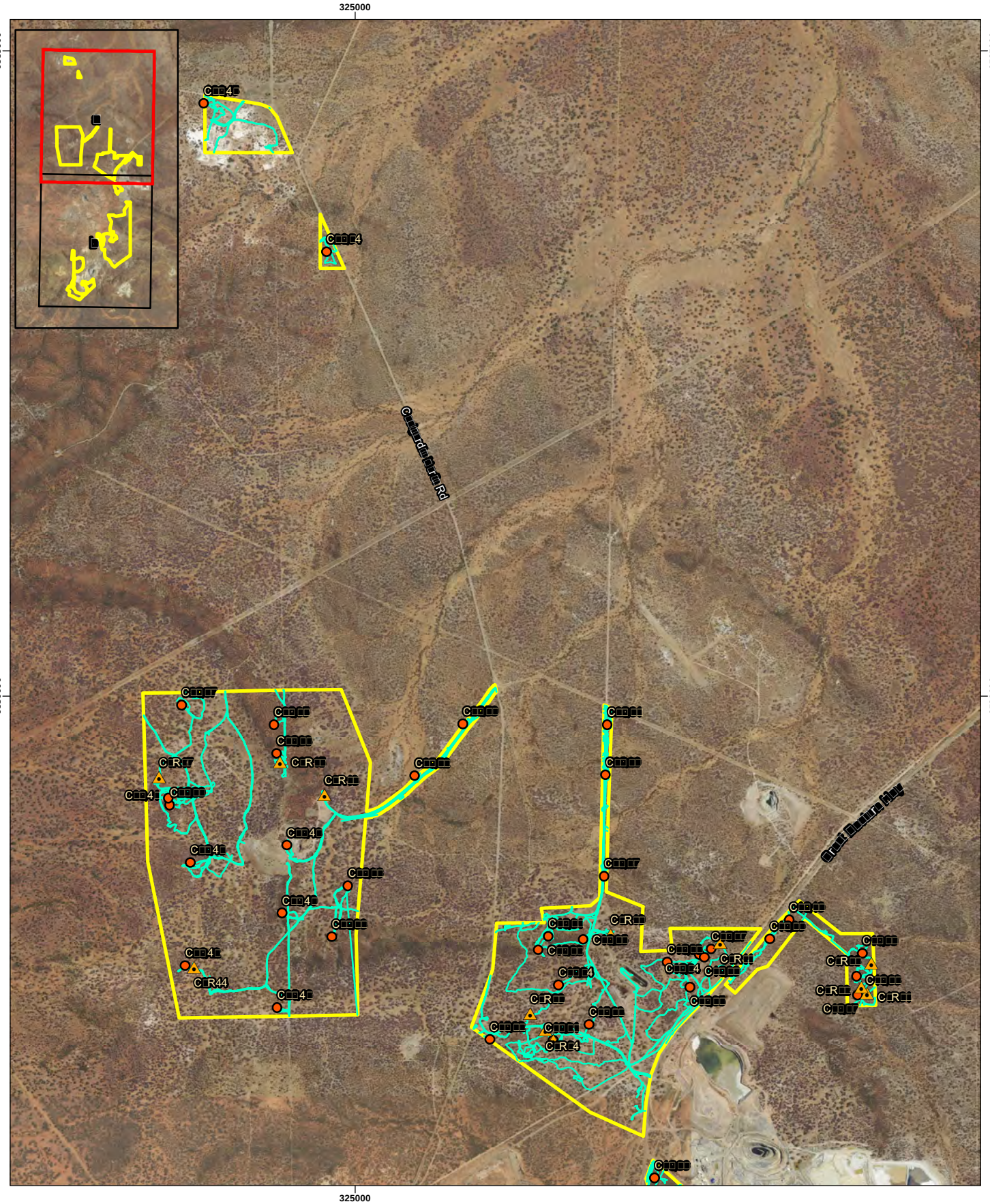

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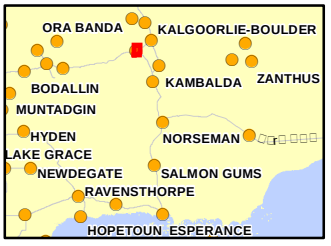

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Focus Mineral Limited

CNX Three Mile Hill Coolgardie Gold Project

Figure 5a

Survey Effort

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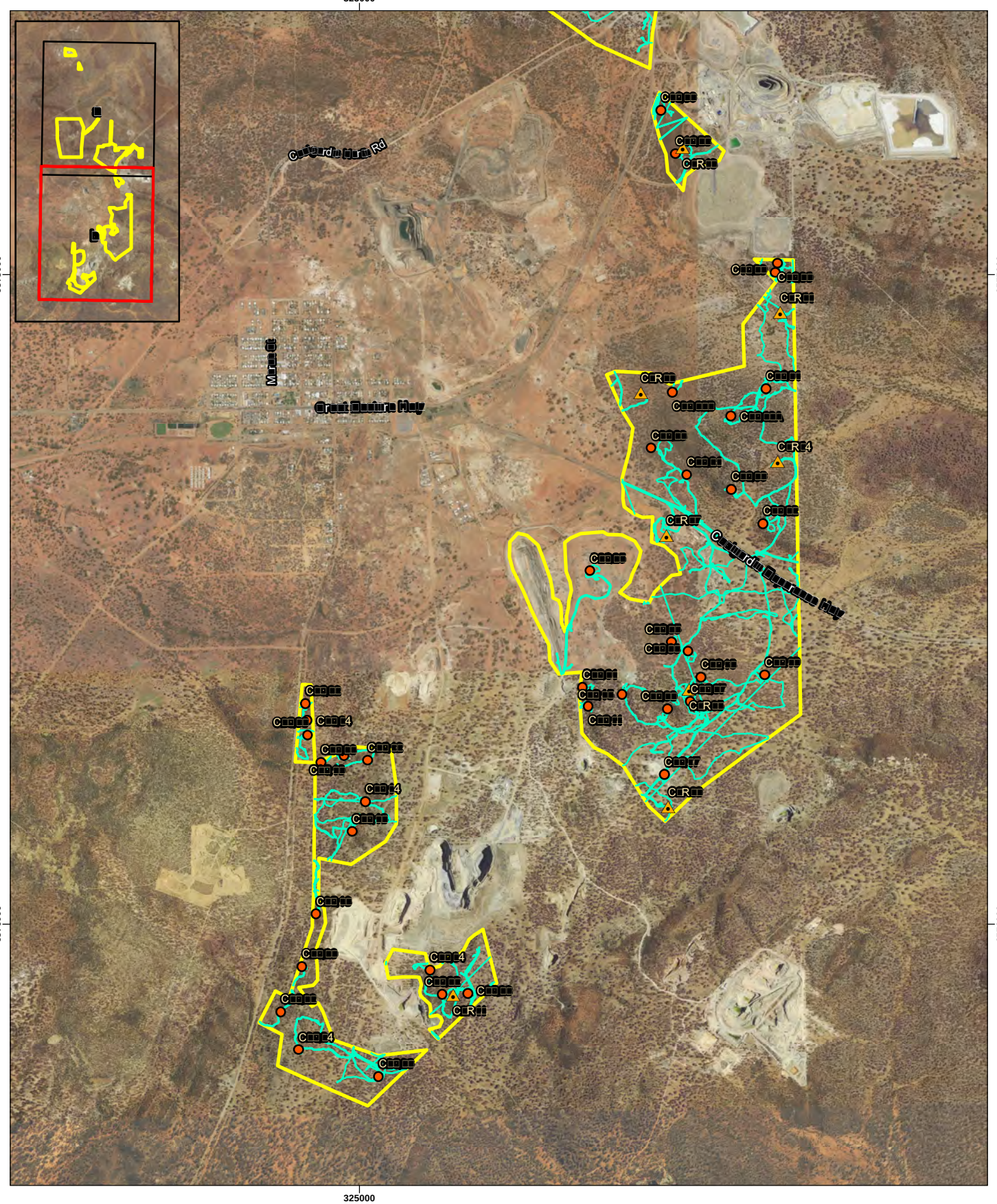

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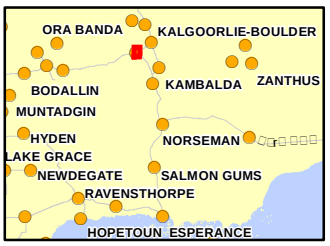
LOCALITY MAP



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Focus Mineral Limited

CNX Three Mile Hill Coolgardie Gold Project

Figure 5b

Survey Effort

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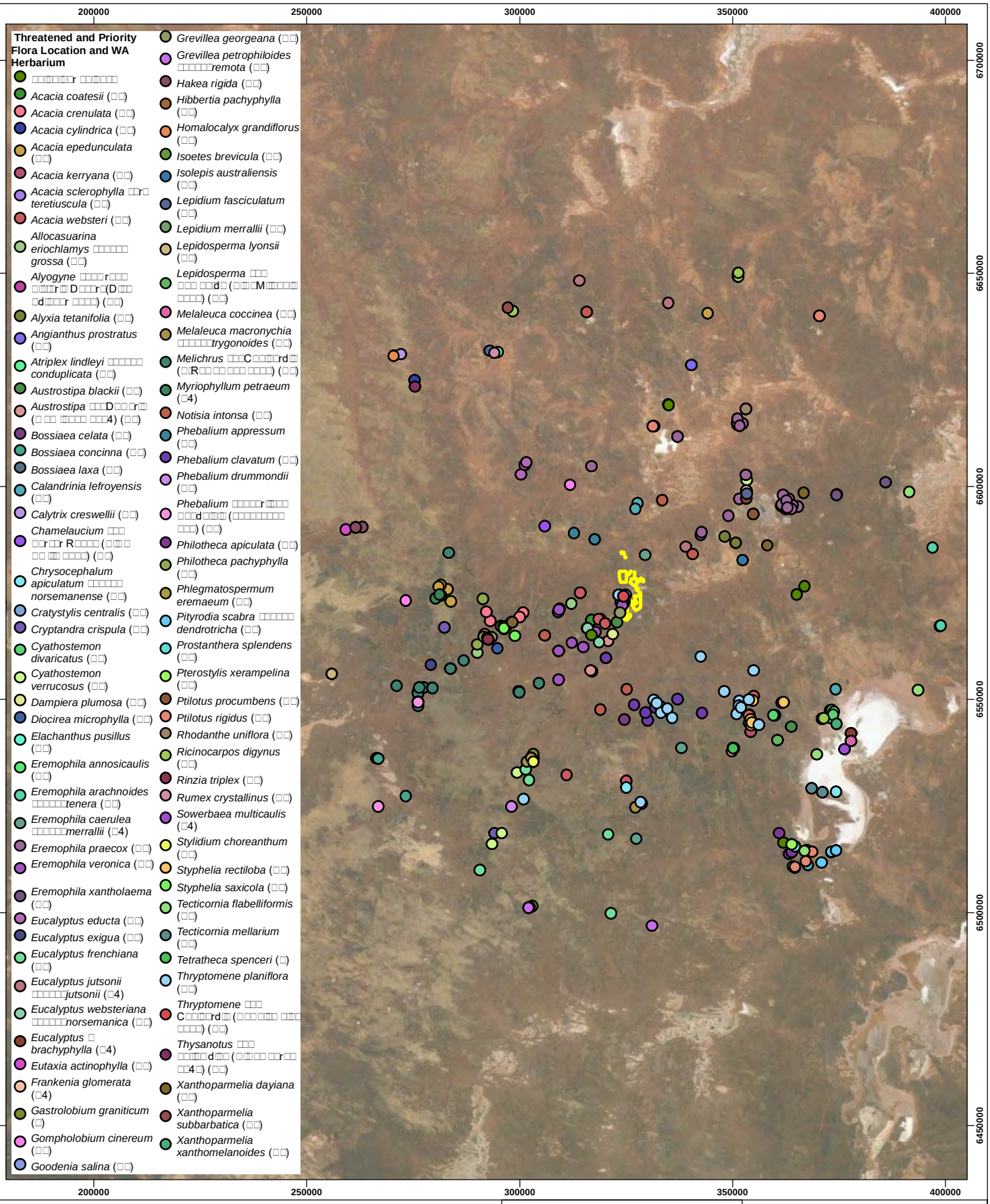

Threatened and Priority Flora Location and WA Herbarium

- □□□□□□□r □□□□□□
- *Acacia coatesii* (□□)
- *Acacia crenulata* (□□)
- *Acacia cylindrica* (□□)
- *Acacia epedunculata* (□□)
- *Acacia kerryana* (□□)
- *Acacia sclerophylla* □□r□ *teretiuscula* (□□)
- *Acacia websteri* (□□)
- *Allocasuarina eriochlamys* □□□□□□ *grossa* (□□)
- *Alyogyne* □□□□r□□□ □□□□r□□D□□□r□(D□□□ □d□□□□r □□□□) (□□)
- *Alyxia tetanifolia* (□□)
- *Angianthus prostratus* (□□)
- *Atriplex lindleyi* □□□□□□ *conduplicata* (□□)
- *Austrostipa blackii* (□□)
- *Austrostipa* □□□D□□□r□□ (□ □□ □□□□□ □□□4) (□□)
- *Bossiaea celata* (□□)
- *Bossiaea concinna* (□□)
- *Bossiaea laxa* (□□)
- *Calandrinia lefroyensis* (□□)
- *Calytrix creswellii* (□□)
- *Chamelaucium* □□□ □□r□□r R□□□□ (□□□□ □□ □□□ □□□□) (□□)
- *Chrysocephalum apiculatum* □□□□□□ *norsemanense* (□□)
- *Cratystylis centralis* (□□)
- *Cryptandra crispula* (□□)
- *Cyathostemon divaricatus* (□□)
- *Cyathostemon verrucosus* (□□)
- *Dampiera plumosa* (□□)
- *Diocirea microphylla* (□□)
- *Elachanthus pusillus* (□□)
- *Eremophila annosicaulis* (□□)
- *Eremophila arachnoides* □□□□□□*tenera* (□□)
- *Eremophila caerulea* □□□□□□*merrallii* (□4)
- *Eremophila praecox* (□□)
- *Eremophila veronica* (□□)
- *Eremophila xantholaema* (□□)
- *Eucalyptus educta* (□□)
- *Eucalyptus exigua* (□□)
- *Eucalyptus frenchiana* (□□)
- *Eucalyptus jutsonii* □□□□□□*jutsonii* (□4)
- *Eucalyptus websteriana* □□□□□□*norsemanica* (□□)
- *Eucalyptus* □ *brachyphylla* (□4)
- *Eutaxia actinophylla* (□□)
- *Frankenia glomerata* (□4)
- *Gastrolobium graniticum* (□)
- *Gompholobium cinereum* (□□)
- *Goodenia salina* (□□)
- *Grevillea georgeana* (□□)
- *Grevillea petrophiloides* □□□□□□*remota* (□□)
- *Hakea rigida* (□□)
- *Hibbertia pachyphylla* (□□)
- *Homalocalyx grandiflorus* (□□)
- *Isoetes brevicula* (□□)
- *Isolepis australiensis* (□□)
- *Lepidium fasciculatum* (□□)
- *Lepidium merrallii* (□□)
- *Lepidosperma lyonsii* (□□)
- *Lepidosperma* □□□ □□□ □□d□ (□□□M□□□□□ □□□□) (□□)
- *Melaleuca coccinea* (□□)
- *Melaleuca macronychia* □□□□□□*trygonoides* (□□)
- *Melichrus* □□□C□□□□rd□□ (□R□□ □□ □□□ □□□□) (□□)
- *Myriophyllum petraeum* (□4)
- *Notisia intonsa* (□□)
- *Phebalium appressum* (□□)
- *Phebalium clavatum* (□□)
- *Phebalium drummondii* (□□)
- *Phebalium* □□□□□r□□□□ □□□d□□□□ (□□□□□□□□□ □□□) (□□)
- *Philotheca apiculata* (□□)
- *Philotheca pachyphylla* (□□)
- *Phlegmatospermum eremaeum* (□□)
- *Pityrodia scabra* □□□□□□ *dendrotricha* (□□)
- *Prostanthera splendens* (□□)
- *Pterostylis xerampelina* (□□)
- *Ptilotus procumbens* (□□)
- *Ptilotus rigidus* (□□)
- *Rhodanthe uniflora* (□□)
- *Ricinocarpos digynus* (□□)
- *Rinzia triplex* (□□)
- *Rumex crystallinus* (□□)
- *Sowerbaea multicaulis* (□4)
- *Stylidium choreanthum* (□□)
- *Styphelia rectiloba* (□□)
- *Styphelia saxicola* (□□)
- *Tecticornia flabelliformis* (□□)
- *Tecticornia mellarium* (□□)
- *Tetratheca spenceri* (□)
- *Thryptomene planiflora* (□□)
- *Thryptomene* □□□ C□□□□rd□□ (□□□□□□□ □□□□ □□□□) (□□)
- *Thysanotus* □□□ □□□□d□□□ (□□□□□ □□r□□ □□4□) (□□)
- *Xanthoparmelia dayiana* (□□)
- *Xanthoparmelia subbarbatica* (□□)
- *Xanthoparmelia xanthomelanoides* (□□)

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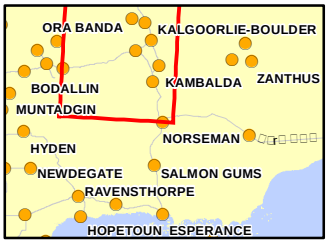
LOCALITY MAP



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CNX Three Mile Hill Coolgardie Gold Project

Figure 6

DBCA Threatened and Priority Flora Locations

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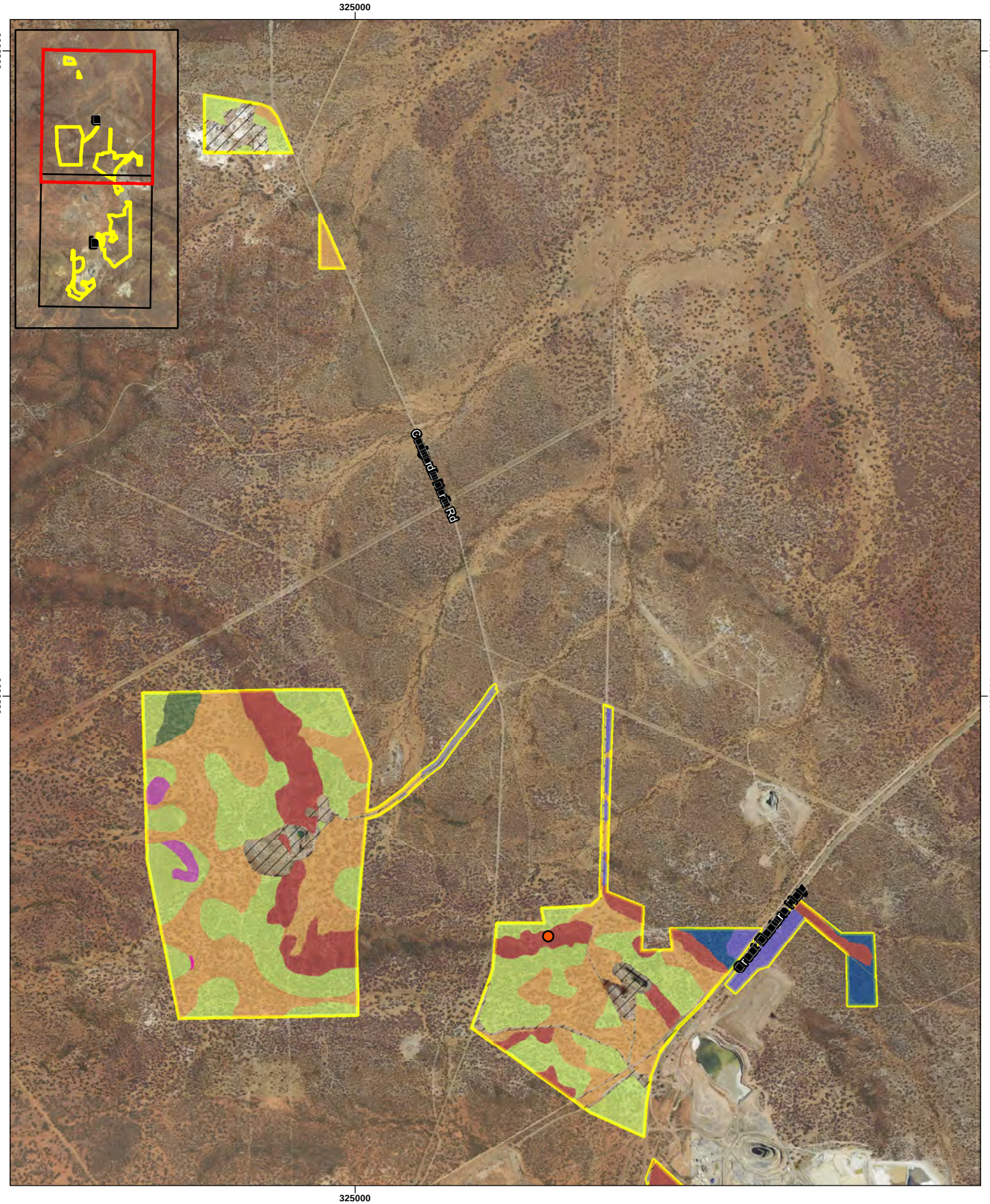

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□□r□□□ □r□□ *Austrostipa blackii* (□□)

Vegetation Types

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LOCALITY MAP

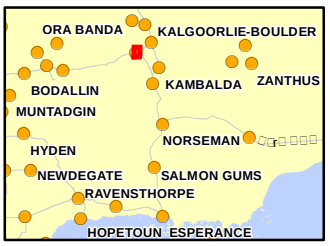

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Figure 7a
Vegetation Types

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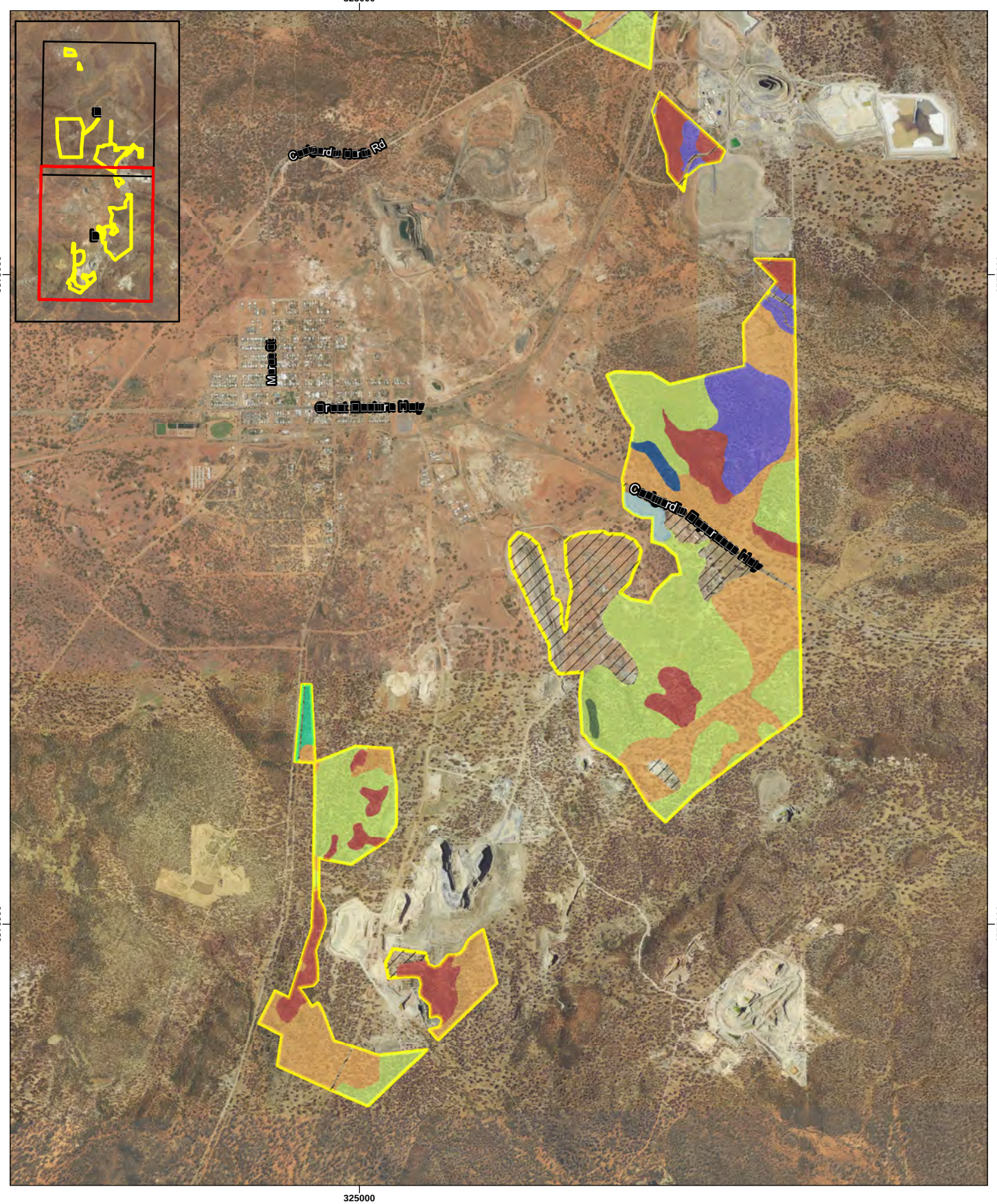

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LOCALITY MAP

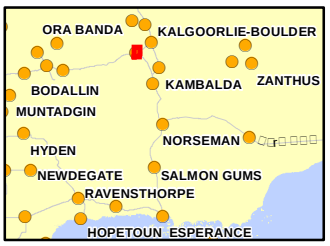

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Figure 7b

Vegetation Types

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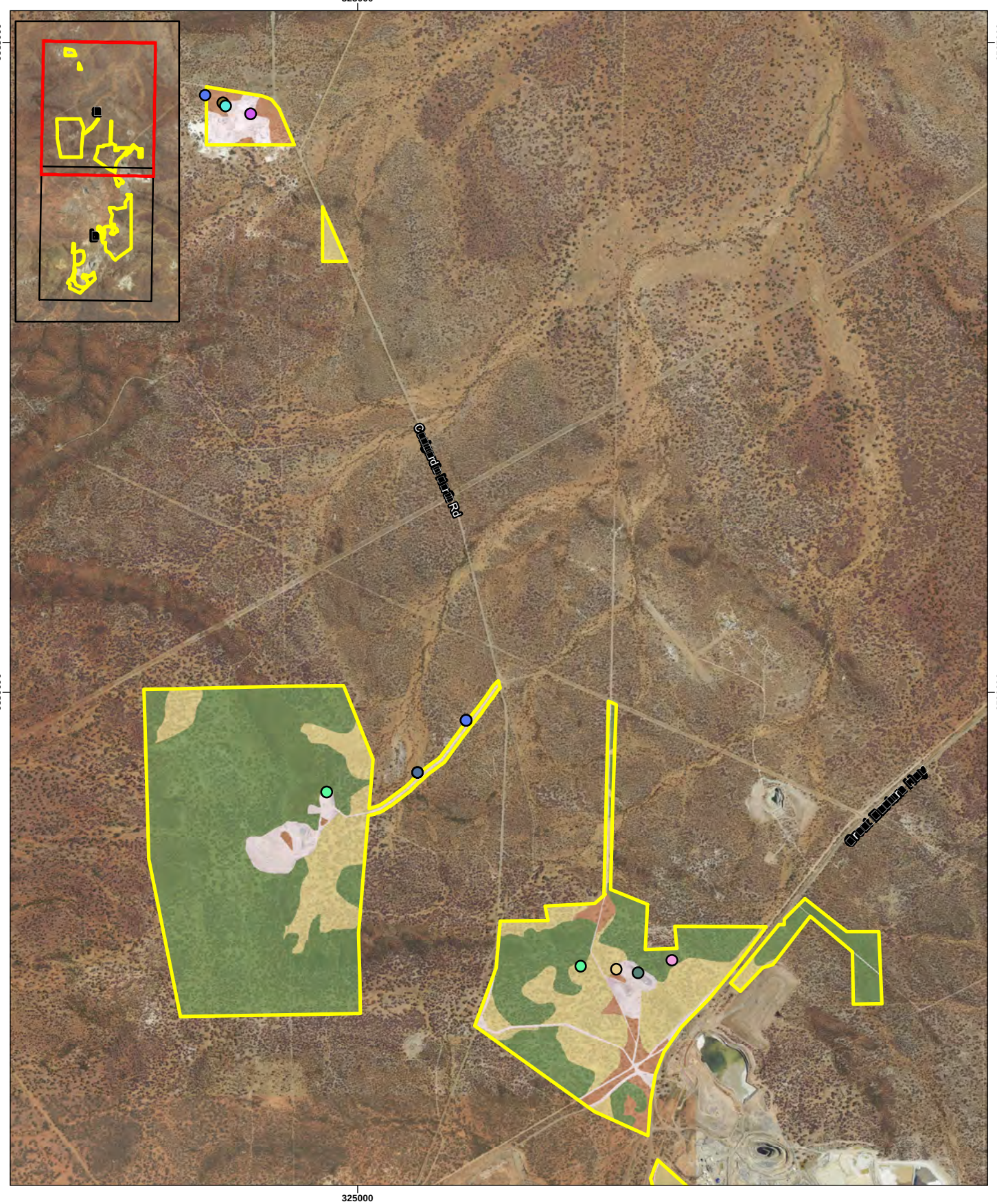

Legend

Weed Species

- *Agave americana*
- *Carrichtera annua*
- *Centaurea melitensis*
- *Crassula ovata*
- *Nicotiana glauca*
- *Oligocarpus calendulaceus*
- *Rumex vesicarius*
- *Salvia verbenaca*
- *Schinus molle* var. *areira*

Vegetation Condition

0 420 840 1,260 Meters

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LOCALITY MAP

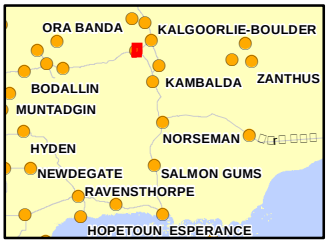

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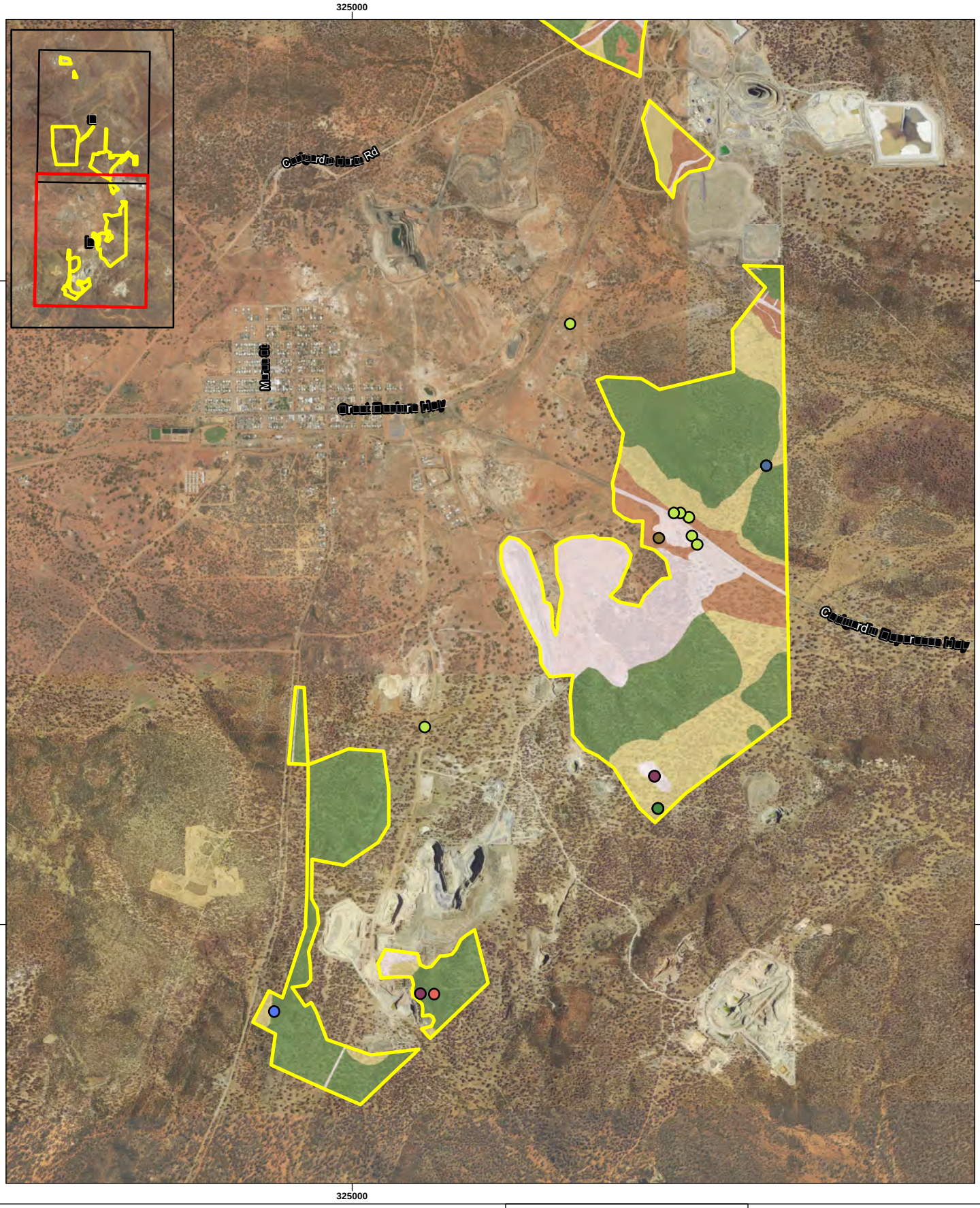
Figure 8a

Vegetation Condition



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Weed Species

- *Asphodelus fistulosus*
- *Carrichtera annua*
- *Centaurea melitensis*
- *Euphorbia drummondii*
- *Heliotropium europaeum*
- *Oligocarpus calendulaceus*
- *Opuntia stricta*
- *Salvia verbenaca*
- *Schinus molle* var. *areira*
- *Sonchus asper*

Vegetation Condition

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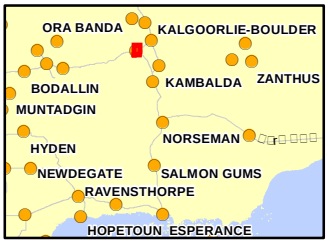
LOCALITY MAP



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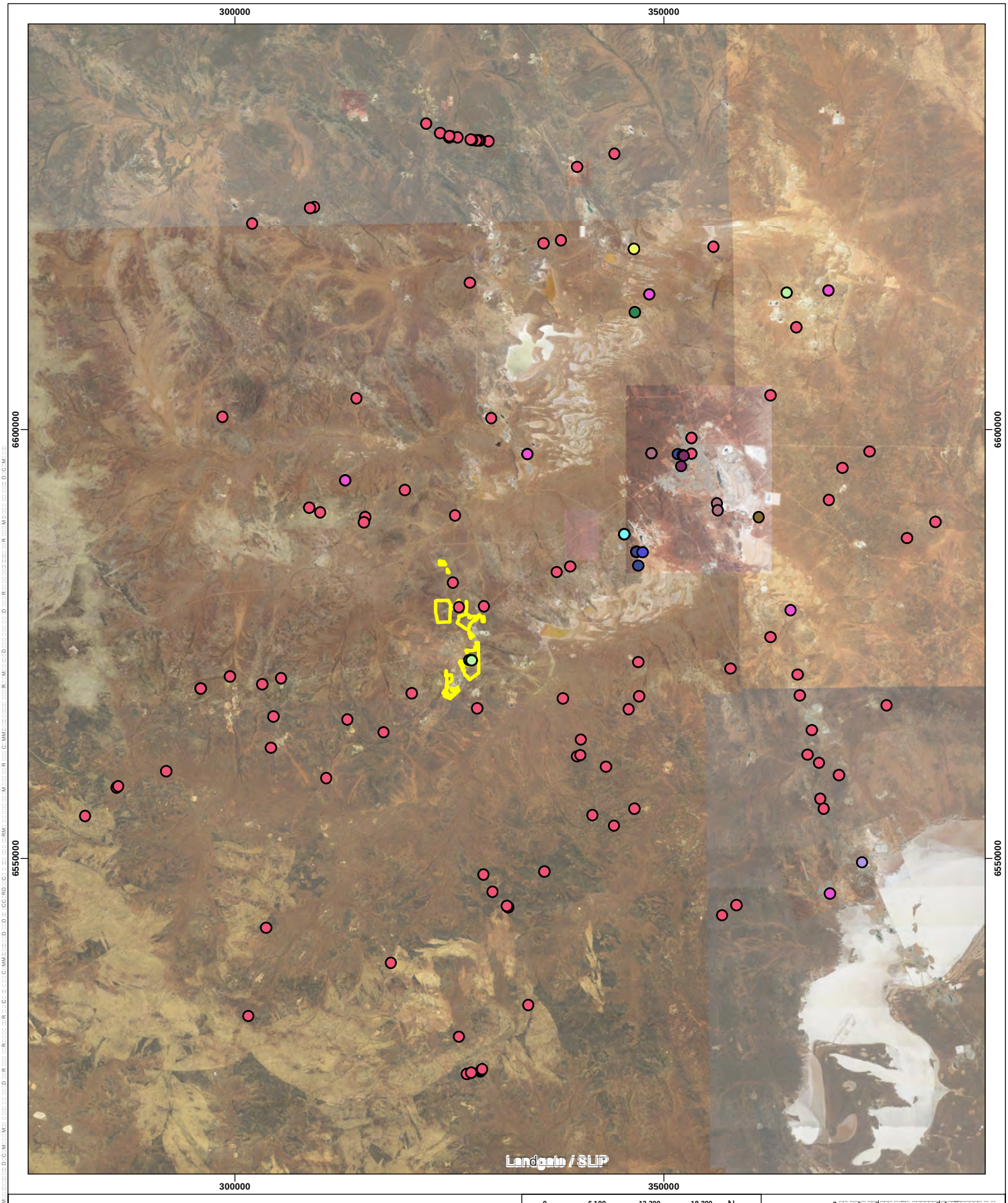
CNX Three Mile Hill Coolgardie Gold Project

Figure 8b
Vegetation Condition



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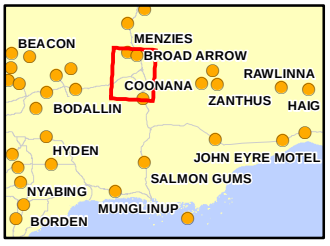

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Figure 9

DBCA Threatened and Priority Fauna Records

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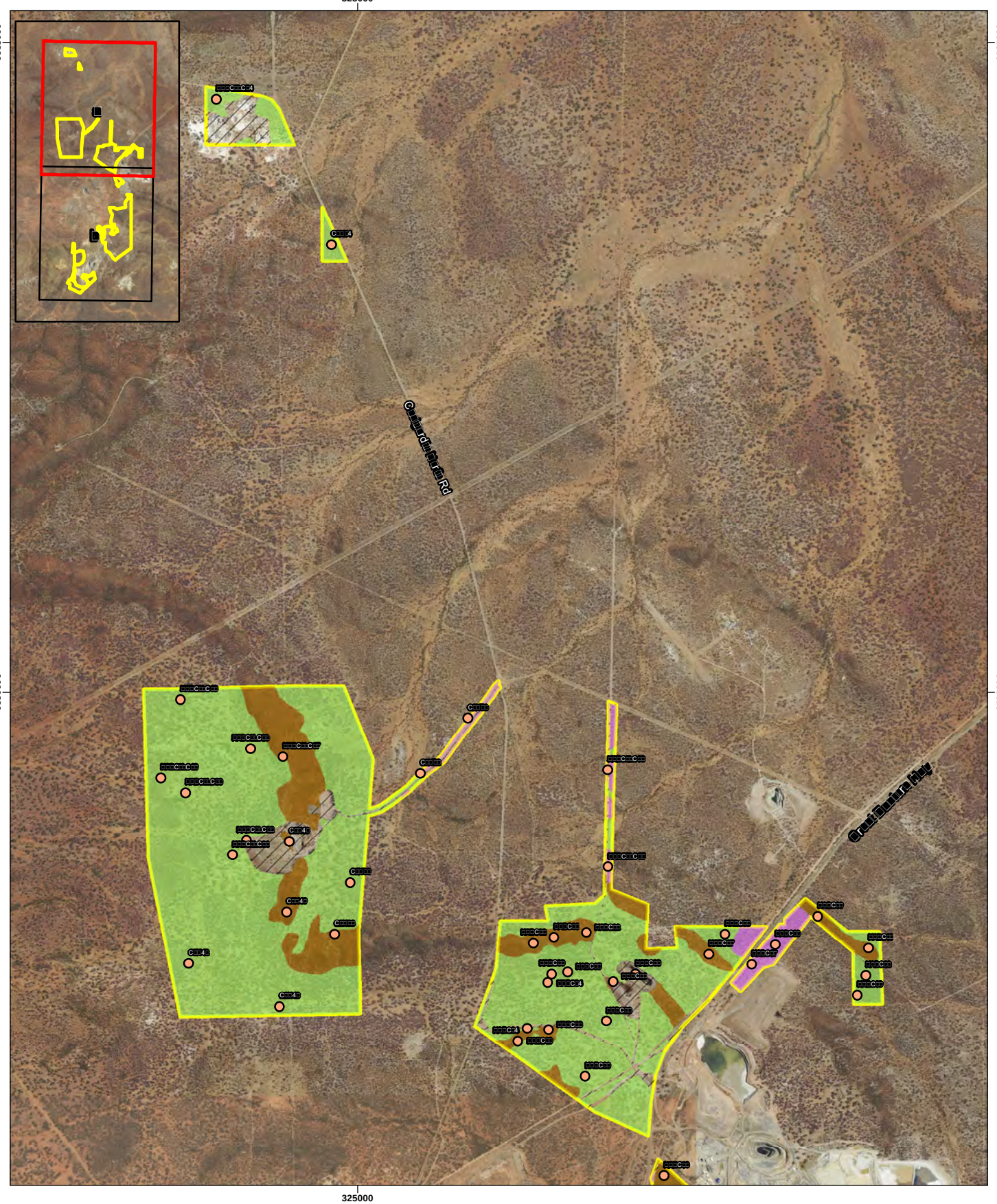

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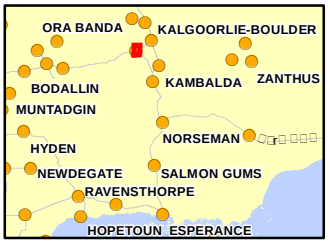

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CNX Three Mile Hill Coolgardie Gold Project

Figure 10a
Fauna Habitat

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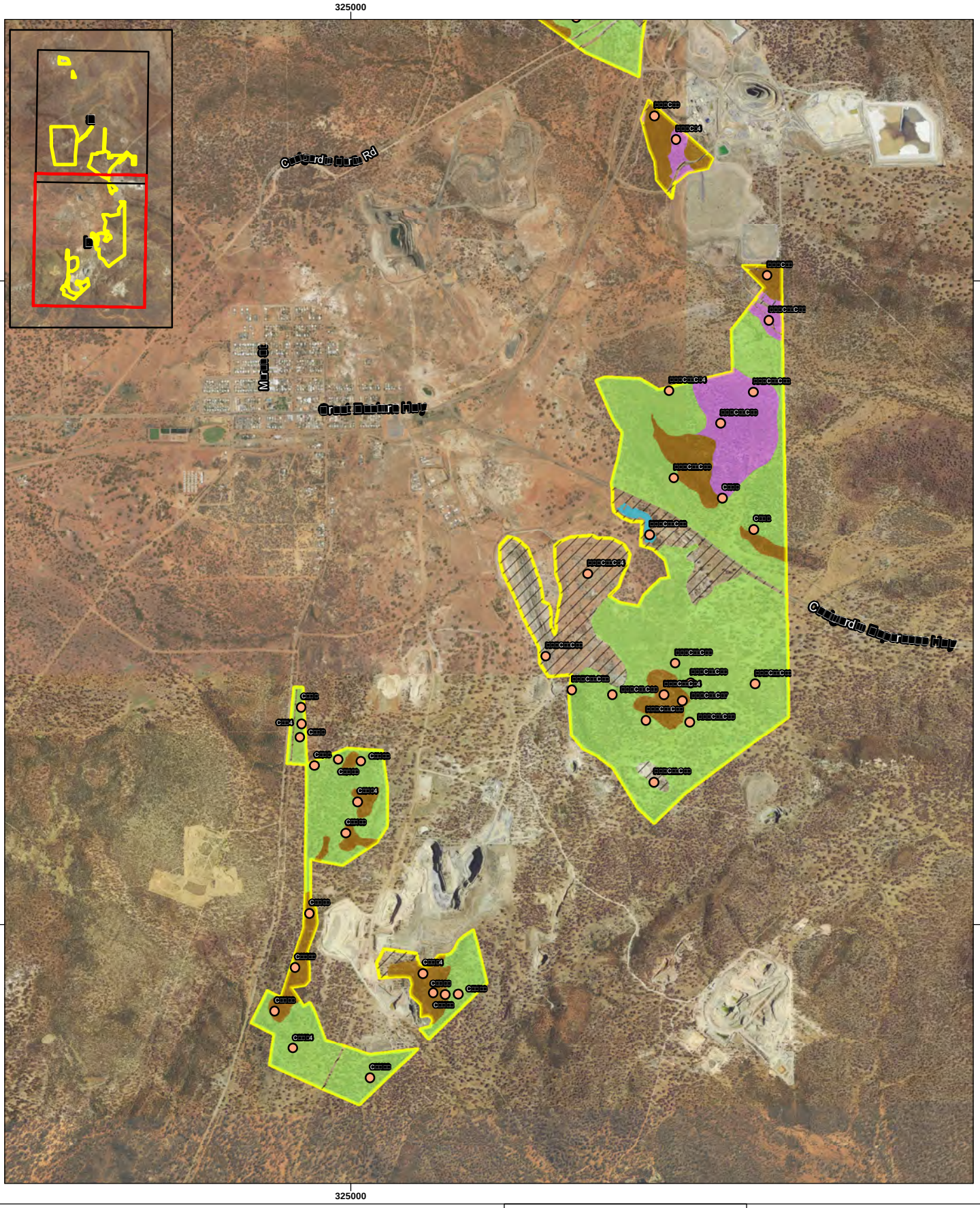

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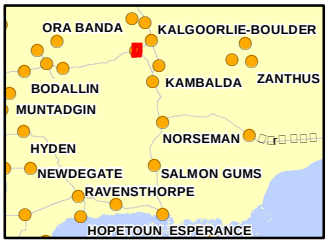

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Figure 10b
Fauna Habitat

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Appendices

Appendix A
Flora and Fauna Literature Review

Appendix A: Fauna Literature Review

Report	Distance to current Survey Area	Survey timing	Survey effort	Recorded conservation significant fauna	Fauna habitats
Coolgardie landfill Flora, Vegetation and Fauna Habitat Assessment (Stategen Environmental 2019)	6.4 kms ESE of Survey Area	18 December 2018	Describe fauna habitat within the Survey Area	None	Open mallee woodland to mallee woodland.
Fauna survey for Mungari Gold Operations Cutters Ridge Project (Phoenix Environmental Sciences, 2019)	40 km North of Survey Area	September 2018	Level 1 Fauna Targeted Malleefowl	Malleefowl (*Leipoa ocellata*)	Open Eucalypt woodland, shrubland, and salt lake, in addition to a small portion of existing cleared areas.
Level 1 Vertebrate Fauna Risk Assessment for Lot 500 Kalgoorlie West (Terrestrial Ecosystems, 2018)	24 km NE of Survey Area	2018	Level 1 Vertebrate Fauna	None	Open eucalypt woodland with a mixed understory of scattered shrubs and chenopods
Vegetation Clearing - Fauna Assessment (Biostat Pty Ltd, 2020)	40 km N of the Survey Area	December 2019	Level 1 Reconnaissance	None	Open woodland: Acacia, Casuarina, and Eucalypt. Chenopod shrubland, Acacia shrubland. Eucalyptus sp. mallee over spinifex Stoney/rocky hills Drainage lines Mulga woodland

Appendix B
Flora and Fauna Database Searches

Appendix B: DBCA Threatened and Priority Fauna

CLASS	SCI_NAME	COM_NAME	WA_status	EPBCstatus	YEAR	SOURCE	CERTAINTY	OBS_METHOD	OBS_TYPE	COUNT	LOCALITY	SITE
Actitis hypoleucos	Common Sandpiper	BIRD	MI	MI	2014	BIRDATA				0	coolgardie gorge	coolgardie gorge
Actitis hypoleucos	Common Sandpiper	BIRD	MI	MI	2011	BIRDATA				0	The Gorge (Coolgardie0	The Gorge (Coolgardie0
Actitis hypoleucos	Common Sandpiper	BIRD	MI	MI	2013	BIRDATA				0	Coolgardie Gorge wetland	Coolgardie Gorge wetland
Tringa nebularia	Common greenshank, greenshank	BIRD	MI	MI	2013	BIRDATA				0	Coolgardie Gorge wetland	Coolgardie Gorge wetland
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	2012	BIRDATA				0	Silver Lake	Silver Lake
Calidris alba	Sanderling	BIRD	MI	MI	2016	BIRDATA				0	Hannan Lake	Hannan Lake
Calyptorhynchus lati	Carnaby's cockatoo	BIRD	EN	EN	2016	BIRDATA				0	367 Collins	367 Collins
Calyptorhynchus lati	Carnaby's cockatoo	BIRD	EN	EN	2016	BIRDATA				0	Cape Lilac on alley	Cape Lilac on alley
Calyptorhynchus lati	Carnaby's cockatoo	BIRD	EN	EN	2017	BIRDATA				0	Piccadilly St West	Piccadilly St West
Tringa brevipes	Grey-tailed tattler	BIRD	P4	MI	2017	BIRDATA				0	Lake Douglas	Lake Douglas
Tringa nebularia	Common greenshank, greenshank	BIRD	MI	MI	1980	BIRDATLAS1				0	KANOWNA	KANOWNA
Tringa glareola	Wood sandpiper	BIRD	MI	MI	1980	BIRDATLAS1				0	KARLKURLA	KARLKURLA
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	1980	BIRDATLAS1				0	KARLKURLA	KARLKURLA
Thinornis rubricollis	Hooded plover, hooded dotterel	BIRD	P4		1980	BIRDATLAS1				0		
Tringa nebularia	Common greenshank, greenshank	BIRD	MI	MI	1980	BIRDATLAS1				0	KANOWNA	KANOWNA
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	1980	BIRDATLAS1				0	FEYSVILLE	FEYSVILLE
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	1981	BIRDATLAS1				0	KARLKURLA	KARLKURLA
Plegadis falcinellus	Glossy ibis	BIRD	MI	MI	1981	BIRDATLAS1				0	KARLKURLA	KARLKURLA
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	1981	BIRDATLAS1				0	KANOWNA	KANOWNA
Tringa nebularia	Common greenshank, greenshank	BIRD	MI	MI	2001	BIRDATLAS2				0	Kopai Lake	Kopai Lake
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	2001	BIRDATLAS2				0	Kopai Lake	Kopai Lake
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	2001	BIRDATLAS2				0	Kopai Lake	Kopai Lake
Tringa glareola	Wood sandpiper	BIRD	MI	MI	2005	BIRDATLAS2				0	Kalgoorlie Sewerage overflow ponds	Kalgoorlie Sewerage overflow ponds
Tringa glareola	Wood sandpiper	BIRD	MI	MI	2005	BIRDATLAS2				0	Kalgoorlie Sewerage outlet	Kalgoorlie Sewerage outlet
Tringa nebularia	Common greenshank, greenshank	BIRD	MI	MI	2006	BIRDATLAS2				0	Young River Station Lake	Young River Station Lake
Calidris ferruginea	curlew sandpiper	BIRD	CR	CR	2006	BIRDATLAS2				0	Young River Station Lake	Young River Station Lake
Calidris ruficollis	Red-necked stint	BIRD	MI	MI	2006	BIRDATLAS2				0	Young River Station Lake	Young River Station Lake
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	2006	BIRDATLAS2				0	Young River Station Lake	Young River Station Lake
Tringa nebularia	Common greenshank, greenshank	BIRD	MI	MI	1999	BIRDATLAS2				0	Kurnalpi Road	Kurnalpi Road
Calidris ferruginea	curlew sandpiper	BIRD	CR	CR	1999	BIRDATLAS2				0	Kurnalpi Road	Kurnalpi Road
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	1999	BIRDATLAS2				0	Kurnalpi Road	Kurnalpi Road
Leipoa ocellata	Malleefowl	BIRD	VU	VU	2012	FAUNASURVEY	Certain	Survey	Unknown	1	FEYSVILLE	Kalgoorlie, Goldfields, Mt Martin
Leipoa ocellata	Malleefowl	BIRD	VU	VU	2012	FAUNASURVEY	Certain	Survey	Unknown	1	FEYSVILLE	Kalgoorlie Region, Goldfields, Jubilee mine
Leipoa ocellata	Malleefowl	BIRD	VU	VU	2012	FAUNASURVEY	Certain	Survey	Unknown	1	FEYSVILLE	Kalgoorlie Region, Goldfields, Jubilee mine
Leipoa ocellata	Malleefowl	BIRD	VU	VU	2012	FAUNASURVEY	Certain	Survey	Unknown	1	FEYSVILLE	Kalgoorlie Region, Goldfields, Jubilee mine
Leipoa ocellata	Malleefowl	BIRD	VU	VU	2012	FAUNASURVEY	Certain	Survey	Unknown	1	FEYSVILLE	Kalgoorlie Region, Goldfields, Jubilee mine
Leipoa ocellata	Malleefowl	BIRD	VU	VU	2012	FAUNASURVEY	Certain	Survey	Unknown	1	BULONG	Hampton Hill, Bulong Mining Lease M25/333
Dasyurus geoffroii	chuditch, western quoll	MAMMAL	VU	VU	1974	TFAUNA	Certain	Opportunistic sighting	Caught or trapped	1	Kambalda East	1 mile N of Kambalda East townsite, at edge of Lake Lefroy in sandy mulga country
Leipoa ocellata	malleefowl	BIRD	VU	VU	1994	TFAUNA	Certain	Opportunistic sighting	Secondary sign	0	Bullabulling	one active nest at Bullabulling No. 8 Pumping station.
Leipoa ocellata	malleefowl	BIRD	VU	VU	1995	TFAUNA	Moderately certain	Opportunistic sighting	Day sighting	1	Londonderry	Yerilla Sandalwood Reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	2000	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Mount Burges	access road to Kundana Mining Lease - "30km NW (10km W & 22km N) of Kalgoorlie"
Branchinella denticu	a fairy shrimp (Carnavon to Kalgoorlie)	INVERTEBRATE	P3		1937	TFAUNA	Certain	Historical (written)	Caught or trapped	0	Gidgi Lake	Gidji Lake, N of Kalgoorlie
Thinornis rubricollis	hooded plover, hooded dotterel	BIRD	P4		1992	TFAUNA	Certain	Survey	Sighting	0	Arrow Lake	Arrow Lake
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1989	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas, 12 km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1991	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas, 12 km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1982	TFAUNA	Certain	Survey	Caught or trapped	2	Lake Douglas	Lake Douglas, 12 km SW of Kalgoorlie

CLASS	SCI_NAME	COM_NAME	WA_status	EPBCstatus	YEAR	SOURCE	CERTAINTY	OBS_METHOD	OBS_TYPE	COUNT	LOCALITY	SITE
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1986	TFAUNA	Certain	Survey	Caught or trapped	15	Lake Douglas	Lake Douglas, 12 km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1986	TFAUNA	Certain	Survey	Caught or trapped	4	Lake Douglas	Lake Douglas, 12 km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1991	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas, Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1987	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1987	TFAUNA	Certain	Survey	Caught or trapped	8	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1987	TFAUNA	Certain	Survey	Caught or trapped	2	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1989	TFAUNA	Certain	Survey	Caught or trapped	2	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1989	TFAUNA	Certain	Survey	Caught or trapped	2	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1989	TFAUNA	Certain	Survey	Caught or trapped	3	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1989	TFAUNA	Certain	Survey	Caught or trapped	6	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1991	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1991	TFAUNA	Certain	Survey	Caught or trapped	4	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Leipoa ocellata	malleefowl	BIRD	VU	VU	1985	TFAUNA	Certain	Opportunistic sighting	Sighting	2	Jaurdie Hills	Jaurdie Hills
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1911	TFAUNA	Certain	Historical (written)	Caught or trapped	1	Kalgoorlie	SW Australia, Kalgoorlie District
Jalmenus aridus	inland hairstreak, desert blue butterfly	INVERTEBRATE	P1		1985	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas 12 km SW of Kalgoorlie
Jalmenus aridus	inland hairstreak, desert blue butterfly	INVERTEBRATE	P1		1989	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas 12 km SW of Kalgoorlie
Jalmenus aridus	inland hairstreak, desert blue butterfly	INVERTEBRATE	P1		1986	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas 12 km SW of Kalgoorlie
Jalmenus aridus	inland hairstreak, desert blue butterfly	INVERTEBRATE	P1		1986	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas 12 km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1985	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas 12 km SW of Kalgoorlie
Leipoa ocellata	malleefowl	BIRD	VU	VU	2006	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Bullabulling	Bullabulling
Leipoa ocellata	malleefowl	BIRD	VU	VU	2007	TFAUNA	Certain	Opportunistic sighting	Day sighting	2	Bullabulling	Bullabulling
Leipoa ocellata	malleefowl	BIRD	VU	VU	2008	TFAUNA	Certain	Opportunistic sighting	Day sighting	2	Bullabulling	Bullabulling pastoral lease, 10km west of the Bullabulling Pub and 2 kms south of the highway
Jalmenus aridus	inland hairstreak, desert blue butterfly	INVERTEBRATE	P1		1997	TFAUNA	Certain	Survey	Caught or trapped	1	Karramindie	Lake Douglas (Douglas Lake)
Leipoa ocellata	malleefowl	BIRD	VU	VU	2009	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Mount Burges	North of Mount Burges
Leipoa ocellata	malleefowl	BIRD	VU	VU	2009	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Bullabulling	Bullabulling, road from Bullabulling to Stewart
Leipoa ocellata	malleefowl	BIRD	VU	VU	2010	TFAUNA	Certain	Opportunistic sighting	Sighting	1		Vic Rock Road
Leipoa ocellata	malleefowl	BIRD	VU	VU	2011	TFAUNA	Certain	Opportunistic sighting	Day sighting	1		Yallari Timber Reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	2011	TFAUNA	Certain	Opportunistic sighting	Secondary sign	0		Yallari Timber Reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	2011	TFAUNA	Certain	Opportunistic sighting	Day sighting	1		
Leipoa ocellata	malleefowl	BIRD	VU	VU	2009	TFAUNA	Certain	Opportunistic sighting	Day sighting	1		on road from Bullabulling to Stuart sighting, off Great Eastern Highway
Leipoa ocellata	malleefowl	BIRD	VU	VU	2009	TFAUNA	Certain	Opportunistic sighting	Day sighting	1		north of Mt Burgess
Leipoa ocellata	malleefowl	BIRD	VU	VU	2011	TFAUNA	Certain	Survey	Caught or trapped	1		gravel area just of side of the raod at Yarri and Bariick Kanowna Belle access road intersection.
Leipoa ocellata	malleefowl	BIRD	VU	VU	2012	TFAUNA	Certain	Opportunistic sighting	Day sighting	2	Coolgardie	Just off cave hill road in Widgiemooltha close to one of Focus Minerals small operations.
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Dead	1	Bullabulling	48km West of Coolgardie, No 8 pump Denardi Station, Great Eastern Highway
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Moderately certain	Opportunistic sighting	Day sighting	1	Bullabulling	~10km east if Bullabulling (40km east of Coolgardie) on Great Eastern Highway
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Moderately certain	Opportunistic sighting	Night sighting	1	Feysville	Out the front of Pevnatty Crib room on active haul road. A higly disturbed area.
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Secondary sign	0	Scahil Timber reserve	Scahil Timber reserve

CLASS	SCI_NAME	COM_NAME	WA_status	EPBCstatus	YEAR	SOURCE	CERTAINTY	OBS_METHOD	OBS_TYPE	COUNT	LOCALITY	SITE
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Burra Rock Conservation Reserve	Carpark at Burra Rock. Mound found within adjacent bush habitat.
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Ora Banda	500m before Cawse Nickel turn off on Broad Arrow-Ora Banda road, heading towards Ora Banda
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Kanowna	~5km before the Mt Pleasant Office turn off on Mt Pleasant Rd, off Menzies Highway
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Dead	1	Kanowna	3.1km north of Paddington Mill (35km north of Kalgoorlie) on Menzies Highway
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Day sighting	1		3.2km east of cawse nickel turn off on the Ora Banda - Broad Arrow Rd
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Moderately certain	Opportunistic sighting	Day sighting	1	Feysville	Woolibar Station, just south of where Woolibar creek crosses the Goldfields Highway.
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Dead	1	Kanowna	~4.45km east of Cawse Nickel turn off on the Broad Arrow- Ora Banda Rd
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Dead	1	Kanowna	~100-200m W of drilling track access road, on the Braod Arrow to Ora Banda road, Near Cawse Nickel turn off.
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Kanowna	~10km W of Menzies Hwy on Ora Banda - Broad Arrow road
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Day sighting	1		3.26km E of Cawse Nickel turn off on Broad Arrow - Ora banda Rd
Leipoa ocellata	malleefowl	BIRD	VU	VU	2014	TFAUNA	Certain	Opportunistic sighting	Day sighting	2	Burra Rock	Burra Rock, Directly west of campsite, south of old east-west track
Leipoa ocellata	malleefowl	BIRD	VU	VU	2015	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Parkeston	100m along a small track - off a major dirt road; approximately 9km NE of Kalgoorlie
Leipoa ocellata	malleefowl	BIRD	VU	VU	2015	TFAUNA	Certain	Opportunistic sighting	Day sighting	2	Bulong	10.6km SSE of Hampton Hill Station homestead
Leipoa ocellata	malleefowl	BIRD	VU	VU	2015	TFAUNA	Certain	Opportunistic sighting	Day sighting	2	Feysville	Brown Hil on Woolubar Station. Kambolda Rd, Boulder WA
Leipoa ocellata	malleefowl	BIRD	VU	VU	2016	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	Coolgardie	Coolgardie North Rd, approx. 5km N of Coolgardie
Leipoa ocellata	malleefowl	BIRD	VU	VU	2016	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	Coolgardie	Coolgardie North Rd, approx. 7km N of Coolgardie, near Bonnievale
Leipoa ocellata	malleefowl	BIRD	VU	VU	2015	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	Coolgardie	Between Burra Rocks Rd and Coolgardie-Esperance Rd, approx. 5km S of Coolgardie
Leipoa ocellata	malleefowl	BIRD	VU	VU	2016	TFAUNA	Certain	Opportunistic sighting	Dusk sighting	1	Yallari Timber Reserve	Yallari Timber Reserve, central N-S track
Leipoa ocellata	malleefowl	BIRD	VU	VU	2016	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	Mount Burges	Traveling route back from Lake Carnage (Coolgardie Nth Rd??), 10km S of Ora Banda
Leipoa ocellata	malleefowl	BIRD	VU	VU	1996	TFAUNA	Moderately certain	Opportunistic sighting	Secondary sign	0	Coolgardie	4WD Holland Track, 200km NE of Mt Holland (cannot find Holland Track)
Leipoa ocellata	malleefowl	BIRD	VU	VU	1965	TFAUNA	Moderately certain	Historical (written)	Secondary sign	0	MOUNT BURGES	12 miles North of Coolgardie
Leipoa ocellata	malleefowl	BIRD	VU	VU	1994	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	2	BULLABULLING	22 kms west of Coolgardie
Leipoa ocellata	malleefowl	BIRD	VU	VU	2004	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	KANOWNA	50 km nth of kalgoorlie on main hwy nth of Mt Vetters homestead
Leipoa ocellata	malleefowl	BIRD	VU	VU	1902	TFAUNA	Moderately certain	Opportunistic sighting	Secondary sign	0	BOORARA	Boorara
Leipoa ocellata	malleefowl	BIRD	VU	VU	2001	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	BULONG	Corsair Mine 10km E of Kalgoorlie; 1km S of Bulong Rd on graded track heading E
Leipoa ocellata	malleefowl	BIRD	VU	VU	1988	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	MOUNT BURGES	Eight Mile Rock dam
Leipoa ocellata	malleefowl	BIRD	VU	VU	2002	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	2	KARRAMINDIE	grt eastern hway 1 km kal side of mungarrie industrial area
Leipoa ocellata	malleefowl	BIRD	VU	VU	2002	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	2	BULONG	Hampton Hill Station, 16km ESE of Boulder b/w Boorara Mine Site & Golden Ridge
Leipoa ocellata	malleefowl	BIRD	VU	VU	1910	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	LAMINGTON	Kalgoorlie
Leipoa ocellata	malleefowl	BIRD	VU	VU	1991	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	BULLABULLING	Kangaroo Hills Timber Reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	1947	TFAUNA	Moderately certain	Opportunistic sighting	Secondary sign	0	LAMINGTON	PO Kalgoorlie
Leipoa ocellata	malleefowl	BIRD	VU	VU	1988	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	MOUNT BURGES	WMC sand pit Jaurdi Hills Rd
Leipoa ocellata	malleefowl	BIRD	VU	VU	1995	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	LONDONDERRY	Yallari Timber Reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	1995	TFAUNA	Moderately certain	Opportunistic sighting	Day sighting	1	LONDONDERRY	Yerilla Sandalwood Reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	2017	TFAUNA	Very Certain (photo, spec	Opportunistic sighting	Day sighting	1	Goldfields Woodlands Conservation P	5km N of Victoria Rock, on Coolgardie Vic Rock Rd, in Goldfields Woodlands CP

CLASS	SCI_NAME	COM_NAME	WA_status	EPBCstatus	YEAR	SOURCE	CERTAINTY	OBS_METHOD	OBS_TYPE	COUNT	LOCALITY	SITE
Leipoa ocellata	malleefowl	BIRD	VU	VU	2017	TFAUNA	Very Certain (photo, spec	Monitoring	Remote camera	1	Londonderry	Scahill Rimber Reserve, on track south of reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	2017	TFAUNA	Very Certain (photo, spec	Monitoring	Remote camera	1	Londonderry	Scahill Rimber Reserve, on track south of reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	2018	TFAUNA	Very Certain (photo, spec	Opportunistic sighting	Dawn sighting	2	Kanowna	Borad Arrow-Ora Banda Rd, 3km E of Cawse Nickel turnoff
Leipoa ocellata	malleefowl	BIRD	VU	VU	2018	TFAUNA	Not sure	Opportunistic sighting	Sighting	1	Ora Banda	Norton Gold field mining lease road
Leipoa ocellata	malleefowl	BIRD	VU	VU	2017	TFAUNA	Moderately certain	Opportunistic sighting	Day sighting	1	Karramindie	Karramindie State Forest No. 8
Leipoa ocellata	malleefowl	BIRD	VU	VU	2017	TFAUNA	Very Certain (photo, spec	Opportunistic sighting	Dusk sighting	1	Karramindie	50m E of the S/W corner gate of Karramindie State Forest, where the gully crosses the track
Leipoa ocellata	malleefowl	BIRD	VU	VU	2018	TFAUNA	Very Certain (photo, spec	Opportunistic sighting	Secondary sign	0	Karramindie	1.7km S of Karramindie State Forest on Hampton Location 53
Leipoa ocellata	malleefowl	BIRD	VU	VU	2018	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Londonberry	Old woodline track running SW away from Scahill Timber Reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	2018	TFAUNA	Very Certain (photo, spec	Monitoring	Remote camera	2	Londonderry	3.5km S of Scahill Timber Reserve, Londonderry
Leipoa ocellata	malleefowl	BIRD	VU	VU	2018	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Kanowna	Golden cities Mine Site haul road, Kanowna
Calyptorhynchus lati	Carnaby's cockatoo	BIRD	EN	EN	2018	TFAUNA	Very Certain (photo, spec	Opportunistic sighting	Day sighting	1	Sommerville	Southern corner of Hay St and Hutton St
Leipoa ocellata	malleefowl	BIRD	VU	VU	2018	TFAUNA	Very Certain (photo, spec	Opportunistic sighting	Day sighting	0	Kalgoorlie	West norh-west of Kalgoorlie about 20km
Leipoa ocellata	malleefowl	BIRD	VU	VU	2018	TFAUNA	Certain	Opportunistic sighting	Day sighting	2	Golden Cities	Goldfields mining tenure
Leipoa ocellata	malleefowl	BIRD	VU	VU	2007	TFAUNA	Certain	Opportunistic sighting		1	Coolgardie	Victoria Rock Rd, about 15km south of Coolgardie
Leipoa ocellata	malleefowl	BIRD	VU	VU	2007	TFAUNA	Certain	Opportunistic sighting		1	Kalgoorlie	Broad Arrow-Ora Banda Rd, few km east of Cawse Mine turnoff
Leipoa ocellata	malleefowl	BIRD	VU	VU	2007	TFAUNA	Certain	Opportunistic sighting		1	Coolgardie	Burra Rock Road, 11.2km north of DEC Burra Rock Reserve boundary sign
Leipoa ocellata	malleefowl	BIRD	VU	VU	2012	TFAUNA	Certain	Opportunistic sighting		4	Coolgardie	Borefields on Focus owned mine lease, near bore 8
Leipoa ocellata	malleefowl	BIRD	VU	VU	2008	TFAUNA	Certain	Opportunistic sighting		1	Kambalda	
Leipoa ocellata	malleefowl	BIRD	VU	VU	2006	TFAUNA	Certain	Opportunistic sighting		1	Coolgardie	23.2km south of T intersection of Coolgardie Norseman Rd
Leipoa ocellata	malleefowl	BIRD	VU	VU	2008	TFAUNA	Certain	Opportunistic sighting	Dusk sighting	1	Coolgardie	Great Eastern Hwy, 40.5km west of Coolgardie
Leipoa ocellata	malleefowl	BIRD	VU	VU	2009	TFAUNA	Certain	Opportunistic sighting		2	Coolgardie	Juardi Hills Rd, 100m north of crest
Leipoa ocellata	malleefowl	BIRD	VU	VU	2009	TFAUNA	Certain	Opportunistic sighting		1	Londonerry	about 3km south of Burra Rock Reserve along Burra Rock Road
Leipoa ocellata	malleefowl	BIRD	VU	VU	2010	TFAUNA	Certain	Opportunistic sighting		1	Londonberry	Burra Rock Nature Reserve, next to camping area
Leipoa ocellata	malleefowl	BIRD	VU	VU	2010	TFAUNA	Certain	Opportunistic sighting		1	Kambalda	5km along pipeline access road off Cave Rocks mine haul rd
Leipoa ocellata	malleefowl	BIRD	VU	VU	2010	TFAUNA	Certain	Opportunistic sighting	Dead	1	Kambalda	9km N of Kambalda T intersection along Goldfields Hwy
Leipoa ocellata	malleefowl	BIRD	VU	VU	2010	TFAUNA	Certain	Opportunistic sighting		1	Bullabulling	Great Eastern Hwy, 130km E of Southern Cross, near unnamed gravel road
Leipoa ocellata	malleefowl	BIRD	VU	VU	2011	TFAUNA	Certain	Opportunistic sighting		1	Ora Banda	Broad Arrow-Ora Banda Rd, approx. 5.5km from Norilsk Nickel access road toward east
Leipoa ocellata	malleefowl	BIRD	VU	VU	2011	TFAUNA	Certain	Opportunistic sighting		2	Londonderry	Burra Rock camping ground
Leipoa ocellata	malleefowl	BIRD	VU	VU	2011	TFAUNA	Certain	Survey		0	Ora Banda	
Leipoa ocellata	malleefowl	BIRD	VU	VU	2011	TFAUNA	Certain	Survey		0	Ora Banda	
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Sighting	1	Coolgardie	7km south of Coolgardie on the Victoria Rock Road
Leipoa ocellata	malleefowl	BIRD	VU	VU	0	TFAUNA	Certain	Opportunistic sighting	Secondary sign	0	Burra Rock Conservation Reserve	
Leipoa ocellata	malleefowl	BIRD	VU	VU	2012	TFAUNA	Certain	Opportunistic sighting	Sighting	1	Kalgoorlie	Goldfield HWY
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Sighting	1	Ora Banda	Between Broad Arrow and Ora Banda
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Sighting	1	Goldfields- Kalgoorlie/Coolgardie	Great Eastern Highway
Leipoa ocellata	malleefowl	BIRD	VU	VU	2019	TFAUNA	Certain	Opportunistic sighting	Dusk sighting	1	Arrow Lake	
Leipoa ocellata	malleefowl	BIRD	VU	VU	2019	TFAUNA	Certain	Opportunistic sighting	Sighting	1	Mungari	Mungari turnoff from Great Eastern HWY heading South
Leipoa ocellata	Malleefowl	BIRD	VU	VU	0	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	KALGOORLIE	Kalgoorlie
Leipoa ocellata	Malleefowl	BIRD	VU	VU	0	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1		Kalgoorlie

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 02/11/2021

Kingdom Animalia
Current Names Only Yes
Core Datasets Only Yes
Species Group All Animals
Method 'By Circle'
Centre 121° 11' 12" E,30° 55' 14" S
Buffer 40km
Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	297	4751
Priority 1	1	5
Priority 4	1	1
Protected under international agreement	6	13
Rare or likely to become extinct	6	67
TOTAL	**311**	**4837**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Rare or likely to become extinct					
1.	24784	*Calidris ferruginea (Curlew Sandpiper)*		T	
2.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)*		T	
3.	24557	*Leipoa ocellata (Malleefowl)*		T	
4.	24168	*Macrotis lagotis (Bilby, Dalgyte, Ninu)*		T	
5.	24146	*Myrmecobius fasciatus (Numbat, Walpurti)*		T	
6.	33987	*Ogyris subterrestris subsp. petrina (Arid Bronze Azure Butterfly)*		T	
Protected under international agreement					
7.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
8.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
9.	24780	*Calidris alba (Sanderling)*		IA	
10.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	
11.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
12.	24808	*Tringa nebularia (Common Greenshank, greenshank)*		IA	
Priority 1					
13.	33979	*Jalmenus aridus (inland hairstreak, desert blue butterfly)*		P1	Y
Priority 4					
14.	24803	*Tringa brevipes (Grey-tailed Tattler)*		P4	
Non-conservation taxon					
15.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
16.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
17.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
18.	24265	*Acanthiza uropygialis (Chestnut-rumped Thornbill)*			
19.	25243	*Acanthophis pyrrhus (Desert Death Adder)*			
20.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
21.	25536	*Accipiter fasciatus (Brown Goshawk)*			
22.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
23.		*Afraflacilla stridulator*			
24.		*Afrosternophorus hirsti*			Y
25.		*Allodessus bistrigatus*			
26.		*Aname armigera*			
27.		*Aname mainae*			
28.	24312	*Anas gracilis (Grey Teal)*			
29.	24313	*Anas platyrhynchos (Mallard)*			
30.	24315	*Anas rhynchotis (Australasian Shoveler)*			
31.	24316	*Anas superciliosa (Pacific Black Duck)*			
32.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
33.		*Anidiops villosus*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
34.	24561	*Anthochaera carunculata (Red Wattlebird)*			
35.	25670	*Anthus australis (Australian Pipit)*			
36.	24599	*Anthus australis subsp. australis (Australian Pipit)*			
37.	25528	*Aphelocephala leucopsis (Southern Whiteface)*			
38.	24266	*Aphelocephala leucopsis subsp. castaneiventris (Southern Whiteface)*			
39.	24285	*Aquila audax (Wedge-tailed Eagle)*			
40.	41324	*Ardea modesta (great egret, white egret)*			
41.	24341	*Ardea pacifica (White-necked Heron)*			
42.	24610	*Ardeotis australis (Australian Bustard)*			
43.		*Argiope protensa*			
44.		*Argiope trifasciata*			
45.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
46.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
47.	24356	*Artamus personatus (Masked Woodswallow)*			
48.		*Austracantha minax*			
49.	24318	*Aythya australis (Hardhead)*			
50.		*Backobourkia heroine*			
51.		*Baiami tegenarioides*			
52.		*Barnardius zonarius*			
53.		*Berosus nutans*			
54.	24319	*Biziura lobata (Musk Duck)*			
55.	42380	*Brachyurophis fasciolatus subsp. fasciolatus (Narrow-banded Shovel-nosed Snake)*			
56.	42381	*Brachyurophis semifasciatus (Southern Shovel-nosed Snake)*			
57.	25715	*Cacatua roseicapilla (Galah)*			
58.	25716	*Cacatua sanguinea (Little Corella)*			
59.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
60.	24253	*Capra hircus (Goat)*	Y		
61.		*Carassius auratus*			
62.		*Celaenia excavata*			
63.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
64.		*Cercophonius michaelseni*			
65.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
66.	24187	*Chalinolobus morio (Chocolate Wattled Bat)*			
67.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
68.	43380	*Chelodina colliei (South-western Snake-necked Turtle)*			
69.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
70.	47909	*Cheramoeca leucosterna (White-backed Swallow)*			
71.		*Chroicocephalus novaehollandiae*			
72.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
73.	24434	*Chrysococcyx osculans (Black-eared Cuckoo)*			
74.	24289	*Circus assimilis (Spotted Harrier)*			
75.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
76.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
77.	24399	*Columba livia (Domestic Pigeon)*	Y		
78.	24361	*Coracina maxima (Ground Cuckoo-shrike)*			
79.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
80.		*Corasoides australis*			
81.		*Corimaethes campestrus*			
82.		*Cormocephalus bungalbinensis*			
83.	24416	*Corvus bennetti (Little Crow)*			
84.	25592	*Corvus coronoides (Australian Raven)*			
85.	25593	*Corvus orru (Torresian Crow)*			
86.	24671	*Coturnix pectoralis (Stubble Quail)*			
87.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
88.	25595	*Cracticus tibicen (Australian Magpie)*			
89.	25596	*Cracticus torquatus (Grey Butcherbird)*			
90.	30893	*Cryptoblepharus buchananii*			
91.	25020	*Cryptoblepharus plagiocephalus*			
92.	25458	*Ctenophorus caudicinctus (Ring-tailed Dragon)*			
93.	24871	*Ctenophorus cristatus (Bicycle Dragon)*			
94.	24873	*Ctenophorus fordi (Mallee Sand Dragon)*			
95.	24874	*Ctenophorus isolepis subsp. citrinus (Yellowy Military Dragon)*			
96.	24882	*Ctenophorus nuchalis (Central Netted Dragon)*			
97.	24886	*Ctenophorus reticulatus (Western Netted Dragon)*			
98.	24888	*Ctenophorus salinarum (Salt Pan Dragon)*			
99.	24889	*Ctenophorus scutulatus (Lozenge-marked Dragon)*			
100.	25026	*Ctenotus atlas*			
101.	25052	*Ctenotus leonhardii*			
102.	25074	*Ctenotus schomburgkii*			
103.	25465	*Ctenotus uber (Spotted Ctenotus)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
104.	25080	*Ctenotus uber subsp. uber (Spotted Ctenotus)*			
105.	25089	*Cyclodomorphus melanops subsp. elongatus (Slender Blue-tongue)*			
106.	24322	*Cygnus atratus (Black Swan)*			
107.		*Cyrtophora parnasia*			
108.		*Daphnia carinata*			
109.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
110.	24606	*Daphoenositta chrysoptera subsp. pileata (Varied Sittella, Black-capped Sitella)*			
111.	24995	*Delma australis*			
112.	25247	*Demansia psammophis subsp. psammophis (Yellow-faced Whipsnake)*			
113.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
114.	25469	*Diplodactylus granariensis*			
115.	24929	*Diplodactylus granariensis subsp. granariensis*			
116.	24940	*Diplodactylus pulcher*			
117.	24470	*Dromaius novaehollandiae (Emu)*			
118.	24650	*Drymodes brunneopygia (Southern Scrub-robin)*			
119.	25092	*Egernia depressa (Southern Pygmy Spiny-tailed Skink)*			
120.	25094	*Egernia formosa*			
121.	25104	*Egernia richardi*			
122.		*Egretta novaehollandiae*			
123.		*Elanus axillaris*			
124.	24290	*Elanus caeruleus subsp. axillaris (Australian Black-shouldered Kite)*			
125.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
126.		*Enochrus elongatulus*			
127.		*Eolophus roseicapillus*			
128.	24651	*Eopsaltria australis subsp. griseogularis (Western Yellow Robin)*			
129.	24567	*Epthianura albifrons (White-fronted Chat)*			
130.	24570	*Epthianura tricolor (Crimson Chat)*			
131.	25109	*Eremiascincus richardsonii (Broad-banded Sand Swimmer)*			
132.		*Eriophora biapicata*			
133.	24379	*Erythrogonys cinctus (Red-kneed Dotterel)*			
134.	24368	*Eurostopodus argus (Spotted Nightjar)*			
135.	25621	*Falco berigora (Brown Falcon)*			
136.	24471	*Falco berigora subsp. berigora (Brown Falcon)*			
137.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
138.	25623	*Falco longipennis (Australian Hobby)*			
139.	24041	*Felis catus (Cat)*	Y		
140.		*Fissarena castanea*			
141.	25727	*Fulica atra (Eurasian Coot)*			
142.	25301	*Furina ornata (Moon Snake)*			
143.	24957	*Gehyra purpurascens*			
144.	24959	*Gehyra variegata*			
145.	25530	*Gerygone fusca (Western Gerygone)*			
146.	24443	*Grallina cyanoleuca (Magpie-lark)*			
147.	24295	*Haliastur sphenurus (Whistling Kite)*			
148.		*Hemicloea sublimbata*			
149.	25232	*Hemidactylus frenatus (Asian House Gecko)*	Y		
150.	25115	*Hemiergis initialis subsp. initialis*			
151.	42408	*Hesperoedura reticulata*			
152.	24961	*Heteronotia binoei (Bynoe's Gecko)*			
153.	47965	*Hieraaetus morphnoides (Little Eagle)*			
154.	25734	*Himantopus himantopus (Black-winged Stilt)*			
155.	24775	*Himantopus himantopus subsp. leucocephalus (Black-winged Stilt)*			
156.	24491	*Hirundo neoxena (Welcome Swallow)*			
157.		*Hoggicosa castanea*			
158.		*Hoggicosa forresti*			
159.		*Holoplatys kalgoorlie*			Y
160.		*Holoplatys planissima*			
161.	34001	*Hylacola cauta subsp. whitlocki (Shy Groundwren)*			
162.		*Idiommata blackwalli*			
163.		*Isometroides vescus*			
164.		*Isopeda magna*			
165.		*Isopedella saundersi*			
166.		*Jalmenus icilius*			Y
167.	24367	*Lalage tricolor (White-winged Triller)*			
168.		*Lampona cylindrata*			
169.		*Lamponina scutata*			
170.		*Latrodectus hasseltii*			
171.		*Lerista kingi*			
172.	25155	*Lerista muelleri*			
173.	25162	*Lerista picturata*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
174.	25172	*Lerista stictopleura*			
175.	42411	*Lerista timida*			
176.	25005	*Lialis burtonis*			
177.	25659	*Lichenostomus leucotis (White-eared Honeyeater)*			
178.	24576	*Lichenostomus leucotis subsp. novaenorciae (White-eared Honeyeater)*			
179.	25661	*Lichmera indistincta (Brown Honeyeater)*			
180.	41411	*Liopholis inornata (Desert Skink)*			
181.	25388	*Litoria moorei (Motorbike Frog)*			
182.	30935	*Lucasium maini*			
183.		*Lycosa ariadnae*			
184.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
185.	24136	*Macropus rufus (Red Kangaroo, Marlu)*			
186.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
187.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
188.	24551	*Malurus pulcherrimus (Blue-breasted Fairy-wren)*			
189.	25654	*Malurus splendens (Splendid Fairy-wren)*			
190.	24583	*Manorina flavigula (Yellow-throated Miner)*			
191.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
192.	24736	*Melopsittacus undulatus (Budgerigar)*			
193.	25184	*Menetia greyii*			
194.	24598	*Merops ornatus (Rainbow Bee-eater)*			
195.		*Microcarbo melanoleucos*			
196.	25693	*Microeca fascinans (Jacky Winter)*			
197.	24654	*Microeca fascinans subsp. assimilis (Jacky Winter)*			
198.		*Missulena occatoria*			
199.	24904	*Moloch horridus (Thorny Devil)*			
200.	25240	*Morelia spilota subsp. imbricata (Carpet Python)*			
201.	25188	*Morethia adelaidensis*			
202.	25190	*Morethia butleri*			
203.	24223	*Mus musculus (House Mouse)*	Y		
204.	25248	*Neelaps bimaculatus (Black-naped Snake)*			
205.	25425	*Neobatrachus kunapalari (Kunapalari Frog)*			
206.	25426	*Neobatrachus pelobatoides (Humming Frog)*			
207.	25427	*Neobatrachus sutor (Shoemaker Frog)*			
208.	25428	*Neobatrachus wilsmorei (Plonking Frog)*			
209.		*Nephila edulis*			
210.	24971	*Nephrurus vertebralis*			
211.		*Nicodamus mainae*			
212.	24096	*Ningaui yvonneae (Southern Ningaui)*			
213.	24229	*Notomys mitchellii (Mitchell's Hopping-mouse)*			
214.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
215.	24742	*Nymphicus hollandicus (Cockatiel)*			
216.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
217.	24618	*Oreoica gutturalis (Crested Bellbird)*			
218.	34011	*Oreoica gutturalis subsp. gutturalis (Crested Bellbird (southern))*			
219.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
220.		*Ostracoda (unident.)*			
221.		*Oxyopes amoenus*			
222.		*Oxyopes dingo*			
223.		*Oxyopes variabilis*			
224.		*Ozestheria packardi*			
225.	24619	*Pachycephala inornata (Gilbert's Whistler)*			
226.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
227.		*Parartemia sp.*			
228.	25253	*Parasuta gouldii*			
229.	25254	*Parasuta monachus*			
230.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
231.	25682	*Pardalotus striatus (Striated Pardalote)*			
232.	24630	*Pardalotus striatus subsp. westraliensis (Striated Pardalote)*			
233.	48060	*Petrochelidon ariel (Fairy Martin)*			
234.	48061	*Petrochelidon nigricans (Tree Martin)*			
235.	24659	*Petroica goodenovii (Red-capped Robin)*			
236.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
237.	24409	*Phaps chalcoptera (Common Bronzewing)*			
238.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
239.	25720	*Platycercus icterotis (Western Rosella)*			
240.	24748	*Platycercus varius (Mulga Parrot)*			
241.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
242.	24751	*Platycercus zonarius subsp. zonarius (Port Lincoln Parrot)*			
243.	25703	*Podargus strigoides (Tawny Frogmouth)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
244.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
245.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
246.	30854	*Polytelis anthopeplus subsp. westralis (Regent Parrot)*			
247.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
248.	34013	*Pomatostomus superciliosus subsp. ashbyi (White-browed Babbler (western wheatbelt))*			
249.	24769	*Porzana fluminea (Australian Spotted Crake)*			
250.	25261	*Pseudechis australis (Mulga Snake)*			
251.	24232	*Pseudomys bolami (Bolam's Mouse)*			
252.	24237	*Pseudomys hermannsburgensis (Sandy Inland Mouse)*			
253.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
254.	25263	*Pseudonaja modesta (Ringed Brown Snake)*			
255.	25434	*Pseudophryne occidentalis (Western Toadlet)*			
256.	42344	*Purnella albifrons (White-fronted Honeyeater)*			
257.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
258.	25009	*Pygopus nigriceps*			
259.	24278	*Pyrrholaemus brunneus (Redthroat)*			
260.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
261.	48096	*Rhipidura albiscapa (Grey Fantail)*			
262.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
263.	24982	*Rhynchoedura ornata (Western Beaked Gecko)*			
264.		*Sandalodes scopifer*			
265.		*Scolopendra laeta*			
266.		*Scolopendra morsitans*			
267.	24199	*Scotorepens balstoni (Inland Broad-nosed Bat)*			
268.		*Selenotholus foelschei*			
269.	25266	*Simoselaps bertholdi (Jan's Banded Snake)*			
270.	30948	*Smicrornis brevirostris (Weebill)*			
271.	24108	*Sminthopsis crassicaudata (Fat-tailed Dunnart)*			
272.	24109	*Sminthopsis dolichura (Little long-tailed Dunnart)*			
273.	24111	*Sminthopsis gilberti (Gilbert's Dunnart)*			
274.	24329	*Stictonetta naevosa (Freckled Duck)*			
275.		*Storena sinuosa*			
276.	25597	*Strepera versicolor (Grey Currawong)*			
277.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
278.	24923	*Strophurus assimilis (Goldfields Spiny-tailed Gecko)*			
279.	24927	*Strophurus elderi*			
280.	25269	*Suta fasciata (Rosen's Snake)*			
281.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
282.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
283.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
284.	30870	*Taeniopygia guttata (Zebra Finch)*			
285.		*Tamopsis circumvidens*			
286.	24176	*Taphozous hilli (Hill's Sheathtail-bat)*			
287.		*Tasmanicosa leuckartii*			
288.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
289.	25203	*Tiliqua occipitalis (Western Bluetongue)*			
290.	25519	*Tiliqua rugosa*			
291.	25207	*Tiliqua rugosa subsp. rugosa*			
292.	42351	*Todiramphus pyrrhopygius (Red-backed Kingfisher)*			
293.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
294.	48141	*Tribonyx ventralis (Black-tailed Native-hen)*			
295.		*Trichocyclus balladong*			
296.	39407	*Triops australiensis (Shield Shrimp)*			
297.	24851	*Turnix velox (Little Button-quail)*			
298.	30814	*Tympanocryptis cephalus (Pebble Dragon)*			
299.	39408	*Tympanocryptis lineata (Lined Earless Dragon)*			
300.	24852	*Tyto alba subsp. delicatula (Barn Owl)*			
301.	24983	*Underwoodisaurus milii (Barking Gecko)*			
302.		*Urodacus armatus*			
303.		*Urodacus hoplurus*			
304.		*Urodacus yaschenkoi*			
305.	24386	*Vanellus tricolor (Banded Lapwing)*			
306.	25211	*Varanus caudolineatus*			
307.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
308.	25526	*Varanus tristis (Racehorse Monitor)*			
309.	24202	*Vespadelus baverstocki (Inland Forest Bat)*			
310.	24206	*Vespadelus regulus (Southern Forest Bat)*			
311.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			

Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

Australian Government

Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

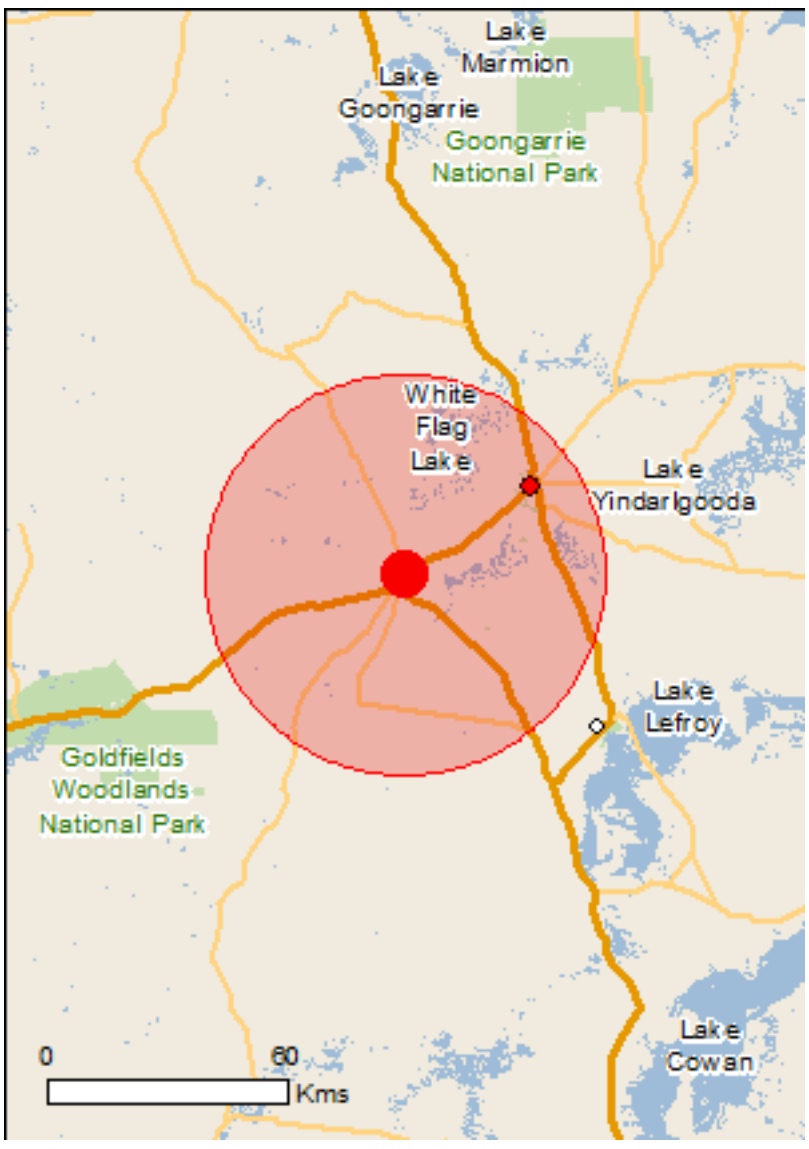
This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 25/10/21 19:14:20

Summary
Details
Matters of NES
Other Matters Protected by the EPBC Act
Extra Information
Caveat
Acknowledgements



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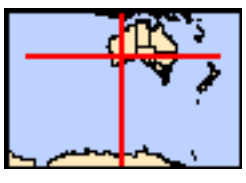
Coordinates

Buffer: 50.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	8
Listed Migratory Species:	7

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	4
Commonwealth Heritage Places:	None
Listed Marine Species:	11
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	9
Regional Forest Agreements:	None
Invasive Species:	16
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

National Heritage Properties		[Resource Information]
Name	State	Status
Historic		
Goldfields Water Supply Scheme, Western Australia	WA	Listed place

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Insects		
Ogyris subterrestris petrina Arid Bronze Azure [77743]	Critically Endangered	Species or species habitat may occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area
Plants		
Gastrolobium graniticum Granite Poison [14872]	Endangered	Species or species habitat known to occur within area
Thelymitra stellata Star Sun-orchid [7060]	Endangered	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		

Name	Threatened	Type of Presence
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -
Defence - AIRTC KALGOORLIE
Defence - KALGOORLIE RIFLE RANGE
Defence - KALGOORLIE TRAINING DEPOT

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area
[Ardea ibis](#) Cattle Egret [59542]		Species or species habitat may occur within area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area
[Chrysococcyx osculans](#) Black-eared Cuckoo [705]		Species or species

Name	Threatened	Type of Presence
		habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Goldfields Woodlands	WA
Kalgoorlie Arboretum	WA
Kambalda	WA
Kangaroo Hills Timber Reserve	WA
Kurrawang	WA
Lakeside Timber Reserve	WA
Scahill Timber Reserve	WA
Victoria Rock	WA
Yallari Timber Reserve	WA

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Equus asinus Donkey, Ass [4]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Carrichtera annua Ward's Weed [9511]		Species or species habitat likely to occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Cylindropuntia spp. Prickly Pears [85131]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-30.92058 121.18644

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Appendix C
Coolgardie Flora Likelihood Table

Appendix: Assessment of the Likelihood of Occurrence of Threatened and Priority Flora as per Desktop Assessment Database Searches surrounding the Survey Area

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2021 DBCA database. High = Suitable habitat present and records less than 15 km from the Survey Area, Medium = Suitable habitat present and records between 15 km and 30 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 30 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing. 1: Department of the Environment (2021). SPRAT EPBC Threatened Flora in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. 2: Department of Biodiversity, Conservation and Attractions (2021). FloraBase - TheWestern Australian Flora. https://florabase.dpaw.wa.gov.au/

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Gastrolobium graniticum	T	EN	X	X	X	25.8	Aug to Sep.	Sand, sandy loam, granite. Margins of rock outcrops, along drainage lines.[2]	No	Medium	Low
Tetratheca spenceri	T				X	39.1	Mar	Gentle slope on duricrust breakaway.[2]	No	Low	Low
Thelymitra stellata	T	EN		X		12.8	Oct - Nov	Grows on ridges and slopes, flats, also on riverbanks and breakaways. Soil types are red, brown, yellow, or grey sandy loams clay or gravel over laterite or gravel. Dry, moist or saline conditions are tolerated.[1]	Yes	High	Medium
Acacia coatesii	P1		X			7.4	Sep	Flat to gentle slope, red sandy loam soils. [2]	Yes	High	Medium
Acacia epedunculata	P1				X	18.6	Aug - Oct	Yellow sand. Sandplains.[2]	Yes	Medium	Low
Acacia sclerophylla var. teretiuscula	P1		X			16.1	Sep - Oct	Clay and loamy soils.[2]	Yes	Medium	Low
Acacia websteri	P1		X		X	0.7	Jun	Red sand, clay or loam. Low-lying areas, flats.[2]	Yes	High	High
Calandrinia lefroyensis	P1				X	10.8	Feb or Apr or Oct - Nov	Light brown, orange or red sand, sandy loam, sandy clay loam over sediments. Fine quartz. Gentle slopes, near salt lakes or salt flats, sand dunes.[2]	Yes	High	Medium
Chamelaucium sp. Parker Range (B.H. Smith 1255)	P1				X	19	Nov or Dec	Sandplains, Mid slope. Dry, yellow sand over laterite.[2]	Yes	Medium	Low
Eremophila xantholaema	P1				X	17.7	Sep - Oct	Hilltop and slopes. Brown/orange/red very rocky loam/granite.[2]	Yes	Medium	Low
Cyathostemon divaricatus	P1				X	40.5	Jan or Jun or Aug	Hills, hillslope.[2]	Yes	Low	Low
Dampiera plumosa	P1		X			4.5	Oct	Red sandy soils.[2]	Yes	High	Medium
Eucalyptus websteriana subsp. norsemanica	P1		X			8.7	Sep to Nov	Rocky rises.[2]	Yes	High	Medium
Lepidosperma lyonsii	P1				X	70.6	Jun	Orange skeletal sandy loam with banded ironstone gravel and rock, well-drained shallow stony loam with quartz. Gentle hill slopes, upper slopes of large hill.[2]	Yes	Low	Low
Lepidosperma sp. Parker Range (N. Gibson & M. Lyons 2094)	P1		X			8.3	NA	Brown sandy loam, or clay. Gravel, laterite. Banded ironstone formations, ridges, mid-slopes.[2]	Yes	High	Medium

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Melichrus sp. Coolgardie (K.R. Newbey 8698)	P1				X	24.8	April or Jun or Aug - Dec	Yellow loamy sand. Sandplains.[2]	Yes	Medium	Low
Phebalium appressum	P1		X			7.8	Jul	Yellow sandplain.[2]	Yes	High	Low
Philotheca apiculata	P1				X	45.8	Aug - Nov	Stony clay loam. Rocky outcrops, hillsides.[2]	Yes	Low	Low
Philotheca pachyphylla	P1				X	31.9	May or Sep	Sand, red loam, clay loam. Sandplains, hill tops.[2]	Yes	Low	Low
Prostanthera splendens	P1				X	66.8	Aug - Oct	Stony loam, shallow soils with ironstone pebbles. Breakaways.[2]	No	Low	Low
Pterostylis xerampelina	P1				X	66.1	Sept - Oct	Granite.[2]	Yes	Low	Low
Ptilotus procumbens	P1				X	30.2	Nov	Red clay.[2]	Yes	Low	Low
Ptilotus rigidus	P1				X	30.4	Mar or May or Oct - Jan	Clay, clay loam on quartz hills and edges of salt lakes. [2]	Yes	Low	Low
Ptilotus sp. Kalgoorlie (J. Jackson & B. Moyle 260)	P1				X	36.1	NA	Quartz hills.[2]	Yes	Low	Low
Rhodanthe uniflora	P1				X	44.8	Aug - Oct	Brown earth. Open *Eucalyptus* woodland.[2]	Yes	Low	Low
Ricinocarpos digynus	P1				X	50.4	Aug	Red-brown sand-loam. Rocky hillslopes and plains.[2]	Yes	Low	Low
Tecticornia flabelliformis	P1	VU		X	X	54.8	Dec	Clay. Saline flats.[2]	Yes	Low	Low
Tecticornia mellarium	P1				X	58.4	NA	Close proximity to salt lakes and dunes.[2]	Yes	Low	Low
Thryptomene planiflora	P1		X			19.1	Jul or Aug - Sep	Brown, yellow or orange sandy loam. Lateritic gravel. Gentle hillslopes, sandplains, slight depressions.[2]	Yes	Medium	Medium
Thryptomene sp. Coolgardie (E. Kelso s.n. 1902)	P1		X			2.2	NA	NA	Unknown	Unknown	Medium
Acacia kerryana	P2				X	39.2	Oct - Dec or Jan - Feb	Granitic loamy sand, stony clayey loam or clayey sand. Low stony ridges, undulating plains.[2]	Yes	Low	Low
Austrostipa frankliniae	P2		X			8.5	Oct - Nov	Flat plain, Basalt slope. Dry brown / red loam.[2]	Yes	High	Medium
Bossiaea laxa	P2				X	43.3	May	Brown loam over deep granite. Sheltered positions around outcrops.[2]	No	Low	Low

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Elachanthus pusillus	P2				X	32.1	Aug - Oct	Dry brown or red-orange loam clay. Quartz, limestone, granite. Low plains, drainage flats, gentle upper slopes.[2]	Yes	Low	Low
Eremophila praecox	P2		X		X	17.2	Oct or Dec.	Red/brown sandy loam. Undulating plains.[2]	Yes	Medium	Low
Eucalyptus educta	P2				X	29.7	Apr	Shallow soils. Granite rocks.[2]	Yes	Medium	Medium
Goodenia salina	P2				X	23.9	May or Aug - Nov	Well-drained, saline, grey or brown loamy clay. Low gypseous dunes near salt pans.[2]	Yes	Medium	Low
Hakea rigida	P2		X		X	61.3	Sep to Oct.	Sandy soils, yellow sand.[2]	Yes	Low	Low
Lepidium merrallii	P2		X			2.5	NA	Clay loam.[2]	Yes	High	Medium
Lepidosperma sp. Kambalda (A.A. Mitchell 5156)	P2				X	45.2	Dec	Lower footslope of basalt hill.[2]	No	Low	Low
Phebalium clavatum	P2		X		X	10.1	Aug - Sep	Sandy soils. Sandplains.[2]	Yes	Medium	Low
Phebalium sp. Yerilgee Sandplain (J. Jackson 223)	P2				X	52.1	Aug	Yellow, orange/red sad, loam. Sandplains.[2]	Yes	Low	Low
Rumex crystallinus	P2				X	55.3	Annual	Arid & semi-arid areas.	Yes	Low	Low
Thysanotus sp. Yellowdine (A.S. George 6040)	P2				X	61.5	Mar or Dec	Yellow sand, sandy clay. Sandplains, undulating ridges.[2]	Yes	Low	Low
Acacia crenulata	P3				X	23.9	April - May or Nov	Clay, sandy clay, yellow sand.[2]	Yes	Medium	Low
Acacia cylindrica	P3				X	63.2	Aug to Oct.	Yellow/brown sand, gravelly soils. Undulating plains, flats.[2]	Yes	Low	Low
Allocasuarina eriochlamys subsp. grossa	P3		X			12.7	Jul	Stony loam, laterite clay. Granite outcrops.[2]	No	High	Low
Alyogyne sp. Great Victoria Desert (D.J. Edinger 6212)	P3				X	2.5	Aug or Dec	Orange, yellow or red sand, sandy loams. Flat plains.[2]	Yes	High	Low
Alyxia tetanifolia	P3				X	21.6	May - Jun or Nov	Sandy clay, loam, concretionary gravel. Drainage lines, near lakes.[2]	Yes	Medium	Low
Angianthus prostratus	P3				X	46.7	Jul - Sep	Red clay or loamy soils. Saline depressions.[2]	Yes	Low	Low
Atriplex lindleyi subsp. conduplicata	P3				X	55.1	NA	Crabhole plains, dry, yellow bare sandy clay, by lakes.[2]	Yes	Low	Low

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Austrostipa blackii	P3		X			1.7	Sep - Nov	Orange, red or brown clay loam, silty sand, sandy clay loam. Gravel, basalt. Winter wet depressions, rocky outcrops, hills sides.[2]	Yes	High	Recorded
Austrostipa turbinata	P3		X			8	Sep - Oct	Hill. Brown sandy clay.[2]	Yes	High	Medium
Bossiaea celata	P3				X	23.3	Sep - Oct	Deep sand. Open mallee.[2]	No	Medium	Low
Bossiaea concinna	P3				X	68.3	Jun - Sep	White or red sand, gravel.[2]	Yes	Low	Low
Calytrix creswellii	P3				X	69.3	Sep to Dec.	Yellow sand, sometimes with lateritic gravel. Sandplains.[2]	Yes	Low	Low
Chrysocephalum apiculatum subsp. norsemanense	P3		X			2.1	Aug - Oct	Well-drained loamy sand. Moderately exposed, gentle undulating plains, hills.[2]	Yes	High	Medium
Cratystylis centralis	P3				X	39.2	Oct	Red sandy loam with ironstone gravel. Flat plains, breakaway country.[2]	Yes	Low	Low
Cryptandra crispula	P3				X	42.7	Aug - Sep	Brown sandy clay, yellow loamy sand, red soil, pebbles. Dune ridges, hills, near salt lakes.[2]	Yes	Low	Low
Cyathostemon verrucosus	P3				X	43.9	Apr or Jul or Aug or Oct	Yellow sand, gentle undulating plain.[2]	Yes	Low	Low
Eremophila annosocaulis	P3				X	69.8	Sep	Stony, flat, sandy plain. Red sand.[2]	Yes	Low	Low
Eremophila arachnoides subsp. tenera	P3				X	71.1	Oct - Dec	Undulating plains, Saline plains, drainage, clay.[2]	Yes	Low	Low
Eremophila veronica	P3		X			0.5	Apr to May.	Stony clay, clay loam. Lateritic breakaways.[2]	No	High	High
Eucalyptus exigua	P3				X	48.7	Mar - Apr or Oct or Dec	Sandy loam, white sand. Sandplains.[2]	Yes	Low	Low
Eucalyptus frenchiana	P3				X	42.2	Oct	Brown or orange loam, sand or sandy clay. Granite. Flat plains, low undulating plains.[2]	Yes	Low	Low
Eutaxia actinophylla	P3				X	64.8	Sep to Oct.	Red-brown clay loam, red clay loam over granite, gravel. Small depressions.	Yes	Low	Low
Gompholobium cinereum	P3				X	19.9	Feb or May or Sep - Nov	Yellow sand, clayey sand, brown loam, sandy gravel, laterite. Well-drained open sites, slopes, plains, roadsides.[2]	Yes	Medium	Low
Grevillea georgeana	P3		X		X	1.1	Jan or Mar or Sep to Nov.	Stony loam/clay. Ironstone hilltops & slopes.	Yes	High	Medium

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Appendix D
Inventory of Vascular Flora

Appendix: Inventory of Vascular Flora

Family	Taxon
Aizoaceae	*Carpobrotus* sp.
Amaranthaceae	*Ptilotus exaltatus*
	Ptilotus holosericeus
	Ptilotus obovatus var. *obovatus*
	Ptilotus polystachyus
Anacardiaceae	**Schinus molle* var. *areira*
Apocynaceae	*Alyxia buxifolia*
	Leichhardtia australis
	Marsdenia australis
	Vincetoxicum lineare
Asparagaceae	**Agave americana*
	Thysanotus manglesianus
Asphodelaceae	**Asphodelus fistulosus*
Asteraceae	**Centaurea melitensis*
	Chrysocephalum puteale
	Cratystylis conocephala
	Olearia muelleri
	Olearia pimeleoides
	**Oligocarpus calendulaceus*
	Rhodanthe chlorocephala subsp. *rosea*
	**Sonchus asper*
	Streptoglossa liatroides
	Vittadinia dissecta var. *hirta*
	Waitzia acuminata var. *acuminata*
Boraginaceae	*Halgania andromedifolia*
	Heliotropium curassavicum
	**Heliotropium europaeum*
Brassicaceae	**Carrichtera annua*
Cactaceae	*Opuntia stricta*
Casuarinaceae	*Allocasuarina ?huegeliana*
	Casuarina pauper
Chenopodiaceae	*Atriplex ?holocarpa*
	Atriplex ?vesicaria
	Atriplex nummularia subsp. *spathulata*
	Atriplex quadrivalvata
	Atriplex sp.
	Atriplex vesicaria
	Chenopodium curvispicatum
	Dysphania melanocarpa forma *leucocarpa*
	?Enchylaena tomentosa
	Enchylaena tomentosa var. *tomentosa*
	Maireana ?georgei
	Maireana ?marginata
	Maireana georgei
	Maireana pentatropis
	Maireana sedifolia
	Maireana tomentosa
	Maireana trichoptera
	Maireana triptera

Appendix: Inventory of Vascular Flora

Family	Taxon
Chenopodiaceae	*Osteocarpum salsuginosum*
	Rhagodia drummondii
	Salsola australis
	Sclerolaena cuneata
	Sclerolaena diacantha
	Sclerolaena fusiformis
	Sclerolaena obliquicuspis
	Tecticornia halocnemoides
Crassulaceae	**Crassula ovata*
Euphorbiaceae	**Euphorbia drummondii*
Fabaceae	*Acacia acuminata*
	Acacia collegialis
	Acacia dissona var. *dissona*
	Acacia erinacea
	Acacia hemiteles
	Acacia jennerae
	Acacia tetragonophylla
	Acacia xerophila var. *brevior*
	Senna artemisioides subsp. *artemisioides*
	Senna artemisioides subsp. *filifolia*
	Senna artemisioides subsp. x *artemisioides*
	Senna stowardii
Frankeniaceae	*Frankenia ?fecunda*
Goodeniaceae	*Goodenia havilandii*
	Goodenia pinnatifida
	Scaevola spinescens
Haloragaceae	*Haloragis trigonocarpa*
Hemerocallidaceae	*Dianella revoluta* var. *divaricata*
Lamiaceae	**Salvia verbenaca*
	Westringia rigida
Malvaceae	*Abutilon cryptopetalum*
	Hibiscus solanifolius
	Hibiscus sturtii var. *grandiflorus*
	Lawrencia repens
	Malvaceae sp.
	Sida petrophila
	Sida ?petrophila
	Calothamnus ?gracilis
	Eucalyptus ?ravida
	Eucalyptus campaspe
	Eucalyptus celastroides
	Eucalyptus clelandiorum
	Eucalyptus griffithsii
	Eucalyptus loxophleba subsp. *lissophloia*
	Eucalyptus oldfieldii
	Eucalyptus oleosa subsp. *oleosa*
	Eucalyptus salmonophloia
	Eucalyptus salubris
	Eucalyptus torquata

Appendix: Inventory of Vascular Flora

Family	Taxon
Myrtaceae	*Eucalyptus websteriana* subsp. *websteriana*
	Melaleuca ?hamata
	Melaleuca pauperiflora subsp. *fastigiata*
Pittosporaceae	*Pittosporum angustifolium*
Poaceae	*Aristida contorta*
	Austrostipa blackii (P3)
	Austrostipa platychaeta
	Austrostipa sp.
	Austrostipa trichophylla
	Chloris truncata
	Enneapogon caerulescens
	Eragrostis dielsii
	Monachather paradoxus
	Rytidosperma sp.
	Triodia desertorum
Polygonaceae	**Rumex vesicarius*
Portulacaceae	*Calandrinia baccata*
	Calandrinia eremaea
Pteridaceae	*Cheilanthes lasiophylla*
	Cheilanthes sieberi subsp. *sieberi*
Rhamnaceae	*Trymalium myrtillus* subsp. *myrtillus*
Rutaceae	*Phebalium laevigatum*
Santalaceae	*Exocarpos aphyllus*
	Santalum acuminatum
	Santalum spicatum
Sapindaceae	*Dodonaea adenophora*
	Dodonaea lobulata
	Dodonaea stenozyga
Scrophulariaceae	*Eremophila alternifolia*
	Eremophila deserti
	Eremophila forrestii
	Eremophila georgei
	Eremophila glabra subsp. *glabra*
	Eremophila interstans subsp. *interstans*
	Eremophila oldfieldii subsp. *angustifolia*
	Eremophila oppositifolia subsp. *angustifolia*
	Eremophila parvifolia subsp. *auricampi*
	Eremophila scoparia
	Myoporum platycarpum subsp. *platycarpum*
Solanaceae	*Lycium australe*
	**Nicotiana glauca*
	Nicotiana rotundifolia
	Solanum cleistogamum
	Solanum lasiophyllum
	Solanum nummularium
Thymelaeaceae	*?Pimelea* sp.
	Pimelea microcephala subsp. *microcephala*
	Pimelea spiculigera var. *thesioides*
Zygophyllaceae	*Roepera glauca*

Appendix: Inventory of Vascular Flora

Family	Taxon
Zygophyllaceae	*Roepera ovata*
	Roepera sp.

Appendix E
Flora Site Data

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q01
Location MGA 50 326500 **mE** 6578134 **mN**

Described by: JW
Date: 12/10/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Laterite, quartz

Vegetation: *Eremophila georgei tall open shrubland over Dodonaea lobulata mid open shrubland over Ptilotus obovatus var. obovatus, Sida petrophila and Vincetoxicum lineare low open herbland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Abutilon cryptopetalum	10	0.1	
Aristida contorta	10	0.1	
Austrostipa blackii (P3)	10	1	
Calandrinia eremaea	10	0.1	
Dodonaea lobulata	150	12	
Eremophila georgei	300	28	
Nicotiana rotundifolia	10	0.1	
Ptilotus obovatus var. obovatus	35	16	
Sida petrophila	25	11	
Solanum cleistogamum	10	0.1	
Solanum lasiophyllum	25	1	
Vincetoxicum lineare	10	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q02
Location MGA 50 326422 **mE** 6578029 **mN**

Described by: JW
Date: 12/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eucalyptus celastroides and Eucalyptus clelandiorum low woodland over Eremophila scoparia mid sparse shrubland over Atriplex sp., Atriplex vesicaria and Atriplex nummularia subsp. spathulata low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex nummularia subsp. spathulata	35	6	
Atriplex sp.	35	16	
Atriplex vesicaria	50	7	
Dodonaea stenozyga	25	1	
Eremophila scoparia	120	6	
Eucalyptus celastroides	500	16	
Eucalyptus clelandiorum	1000	5	
Exocarpos aphyllus	45	1	
Haloragis trigonocarpa	25	0.5	
Lycium australe	40	2	
Ptilotus holosericeus	5	0.1	
Ptilotus obovatus var. obovatus	35	1	
Roepera sp.	10	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q03
Location MGA 50 327421 **mE** 6577933 **mN**

Described by: JW
Date: 12/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eucalyptus campaspe low woodland over Eremophila scoparia mid sparse shrubland over Senna artemisioides subsp. x artemisioides, Atriplex sp. and Olearia muelleri low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex sp.	40	6	
**Carrichtera annua*	25	2	
Eremophila scoparia	140	3	
Eucalyptus campaspe	300	26	
Olearia muelleri	50	6	
Ptilotus obovatus var. obovatus	20	2	
Senna artemisioides subsp. x artemisioides	100	12	
Streptoglossa liatroides	5	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q04
Location MGA 50 327671 **mE** 6577991 **mN**

Described by: JW
Date: 12/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: N/A

Vegetation: *Exocarpos aphyllus, Eremophila oldfieldii subsp. angustifolia and Acacia tetragonophylla mid shrubland over Dodonaea lobulata mid open shrubland over Scaevola spinescens, Olearia muelleri and Eremophila alternifolia low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia tetragonophylla	180	6	
Dodonaea lobulata	110	12	
Eremophila alternifolia	50	1	
Eremophila oldfieldii subsp. angustifolia	200	12	
Exocarpos aphyllus	200	26	
Lycium australe	5	0.1	
Maireana georgei	18	1	
Marsdenia australis	10	1	
Olearia muelleri	45	2	
Ptilotus obovatus var. obovatus	20	1	
Scaevola spinescens	100	6	
Thysanotus manglesianus	100	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q05
Location MGA 50 327597 **mE** 6577741 **mN**

Described by: JW
Date: 12/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eucalyptus clelandiorum and Eucalyptus campaspe low open woodland over Eremophila scoparia and Senna artemisioides subsp. x artemisioides mid open shrubland over Cheilanthes lasiophylla and Ptilotus obovatus var. obovatus low sparse herbland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Cheilanthes lasiophylla	15	4	
Eremophila oldfieldii subsp. angustifolia	35	0.1	
Eremophila scoparia	200	20	
Eucalyptus campaspe	300	4	
Eucalyptus clelandiorum	500	5	
Maireana ?marginata	5	1	
Olearia muelleri	20	1	
Ptilotus obovatus var. obovatus	30	1	
Senna artemisioides subsp. x artemisioides	130	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q06
Location MGA 50 327323 **mE** 6576260 **mN**

Described by: JW
Date: 12/10/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Laterite, quartz

Vegetation: *Exocarpos aphyllus tall open shrubland over Dodonaea lobulata and Dodonaea adenophora low shrubland over Haloragis trigonocarpa, Thysanotus manglesianus and Ptilotus obovatus var. obovatus low open herbland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Dodonaea adenophora	100	12	
Dodonaea lobulata	90	25	
Exocarpos aphyllus	220	11	
Haloragis trigonocarpa	10	11	
Ptilotus obovatus var. obovatus	20	1	
Thysanotus manglesianus	20	2	
Waitzia acuminata var. acuminata	18	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q07
Location MGA 50 328895 **mE** 6577682 **mN**

Described by: JW
Date: 13/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eucalyptus torquata low woodland over Exocarpos aphyllus mid sparse shrubland over Westringia rigida, Olearia muelleri and Scaevola spinescens low shrubland*

Condition: Excellent **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eremophila parvifolia subsp. auricampi	40	5	
Eucalyptus torquata	400	12	
Exocarpos aphyllus	110	1	
Olearia muelleri	25	11	
Scaevola spinescens	40	6	
Westringia rigida	40	16	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q08
Location MGA 50 328889 **mE** 6577825 **mN**

Described by: JW
Date: 13/10/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: N/A

Vegetation: *Eucalyptus campaspe and Eucalyptus griffithsii low open woodland over Eremophila scoparia, Senna artemisioides subsp. filifolia and Exocarpos aphyllus mid shrubland over Senna artemisioides subsp. x artemisioides, Acacia erinacea and Olearia muelleri low shrubland*

Condition: Excellent **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia erinacea	40	13	
Eremophila interstans subsp. interstans	200	4	
Eremophila oldfieldii subsp. angustifolia	35	1	
Eremophila scoparia	140	23	
Eucalyptus campaspe	400	5	
Eucalyptus griffithsii	500	5	
Exocarpos aphyllus	200	8	
Lycium australe	100	0.1	
Maireana georgei	20	0.1	
Myoporum platycarpum subsp. platycarpum	100	1	
Olearia muelleri	35	3	
Santalum acuminatum	55	1	
Senna artemisioides subsp. x artemisioides	100	15	
Senna artemisioides subsp. filifolia	140	10	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q09
Location MGA 50 328932 **mE** 6578002 **mN**

Described by: JW
Date: 13/10/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Laterite

Vegetation: *Eucalyptus oleosa subsp. oleosa low open woodland over Eremophila oldfieldii subsp. angustifolia, Senna artemisioides subsp. filifolia and Trymalium myrtillus subsp. myrtillus mid shrubland over Westringia rigida, Eremophila parvifolia subsp. auricampi and Calothamnus ?gracilis low shrubland*

Condition: Excellent **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia jennerae	25	1	
Alyxia buxifolia	40	1	
Atriplex vesicaria	60	5	
Calothamnus ?gracilis	70	6	
Dodonaea stenozyga	185	5	
Eremophila oldfieldii subsp. angustifolia	200	15	
Eremophila oppositifolia subsp. angustifolia	130	5	
Eremophila parvifolia subsp. auricampi	50	12	
Eucalyptus oleosa subsp. oleosa	700	10	
Ptilotus obovatus var. obovatus	15	1	
Senna artemisioides subsp. filifolia	200	11	
Trymalium myrtillus subsp. myrtillus	140	11	
Westringia rigida	25	15	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q10
Location MGA 50 328368 **mE** 6578263 **mN**

Described by: JW
Date: 13/10/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: N/A

Vegetation: *Eucalyptus griffithsii low open woodland over Acacia jennerae, Eremophila oldfieldii subsp. angustifolia and Exocarpos aphyllus mid open shrubland over Eremophila glabra subsp. glabra, Dodonaea stenozyga and Olearia pimeleoides low shrubland*

Condition: Excellent **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia jennerae	110	10	
Aristida contorta	100	1	
Dodonaea stenozyga	100	6	
Eremophila glabra subsp. glabra	60	18	
Eremophila oldfieldii subsp. angustifolia	120	5	
Eucalyptus griffithsii	400	5	
Exocarpos aphyllus	130	5	
Olearia pimeleoides	25	6	
Ptilotus obovatus var. obovatus	10	0.1	
Santalum spicatum	180	3	
Senna artemisioides subsp. filifolia	120	5	
Westringia rigida	20	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q20
Location MGA 50 328215 **mE** 6578113 **mN**

Described by: JW
Date: 13/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila oldfieldii subsp. angustifolia tall open shrubland over Eremophila interstans subsp. interstans mid open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia jennerae	100	5	
Eremophila interstans subsp. interstans	120	15	
Eremophila oldfieldii subsp. angustifolia	300	19	
Eremophila parvifolia subsp. auricampi	45	6	
Eucalyptus griffithsii	400	2	
Maireana sedifolia	80	3	
Olearia pimeleoides	30	5	
Senna artemisioides subsp. x artemisioides	100	2	
Sida petrophila	28	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q21
Location MGA 50 326536 **mE** 6577327 **mN**

Described by: JW
Date: 13/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite

Vegetation: *Dodonaea stenozyga, Senna artemisioides subsp. filifolia and Eremophila oldfieldii subsp. angustifolia mid closed shrubland over Atriplex vesicaria low sparse shrubland over Ptilotus obovatus var. obovatus low open herbland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex vesicaria	80	5	
Dodonaea stenozyga	180	40	
Eremophila oldfieldii subsp. angustifolia	140	15	
Ptilotus obovatus var. obovatus	28	16	
Senna artemisioides subsp. filifolia	180	20	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q22
Location MGA 50 326045 **mE** 6577335 **mN**

Described by: JW
Date: 13/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eucalyptus salmonophloia low open woodland over Senna artemisioides subsp. x artemisioides and Senna artemisioides subsp. filifolia low sparse shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eucalyptus salmonophloia	600	5	
Senna artemisioides subsp. x artemisioides	45	6	
Senna artemisioides subsp. filifolia	35	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q23
Location MGA 50 326813 **mE** 6577450 **mN**

Described by: JW
Date: 14/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eucalyptus salmonophloia low woodland over Senna artemisioides subsp. x artemisioides, Senna artemisioides subsp. filifolia and Eremophila parvifolia subsp. auricampi low sparse shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eremophila parvifolia subsp. auricampi	35	1	
Eucalyptus salmonophloia	1000	19	
Senna artemisioides subsp. x artemisioides	100	2	
Senna artemisioides subsp. filifolia	75	2	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q24
Location MGA 50 326578 **mE** 6577758 **mN**

Described by: JW
Date: 14/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eucalyptus campaspe low woodland over Senna artemisioides subsp. x artemisioides mid sparse shrubland over Senna artemisioides subsp. filifolia low sparse shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eucalyptus campaspe	400	15	
Senna artemisioides subsp. x artemisioides	130	2	
Senna artemisioides subsp. filifolia	45	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q25
Location MGA 50 326770 **mE** 6578110 **mN**

Described by: JW
Date: 14/10/2021
Type: QUADRAT

Landform: Upper slope
Rock Type: N/A

Vegetation: *Acacia acuminata tall open shrubland over Eremophila oldfieldii subsp. angustifolia mid sparse shrubland over Sida petrophila, Solanum lasiophyllum and Dodonaea stenozyga low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	400	20	
Austrostipa sp.	10	1	
Dodonaea stenozyga	50	1	
Eremophila georgei	20	0.1	
Eremophila oldfieldii subsp. angustifolia	130	10	
Haloragis trigonocarpa	10	3	
Ptilotus exaltatus	30	1	
Ptilotus obovatus var. obovatus	20	1	
Senna artemisioides subsp. filifolia	30	0.1	
Sida petrophila	100	5	
Solanum lasiophyllum	30	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q26
Location MGA 50 327707 **mE** 6577970 **mN**

Described by: JW
Date: 14/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: N/A

Vegetation: *Eremophila oldfieldii subsp. angustifolia, Dodonaea lobulata and Senna artemisioides subsp. x artemisioides mid shrubland over Ptilotus obovatus var. obovatus low sparse herbland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Dodonaea lobulata	140	12	
Eremophila oldfieldii subsp. angustifolia	190	20	
Ptilotus obovatus var. obovatus	35	1	
Senna artemisioides subsp. x artemisioides	170	12	
Senna artemisioides subsp. filifolia	200	10	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q27
Location MGA 50 327762 **mE** 6578035 **mN**

Described by: JW
Date: 14/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: N/A

Vegetation: *Eucalyptus torquata low open woodland over Eremophila interstans subsp. interstans, Senna artemisioides subsp. filifolia and Olearia muelleri low sparse shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eremophila interstans subsp. interstans	50	2	
Eucalyptus torquata	500	8	
Exocarpos aphyllus	25	0.1	
Maireana tomentosa	10	1	
Olearia muelleri	35	1	
Senna artemisioides subsp. filifolia	55	2	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q28
Location MGA 50 327436 **mE** 6575925 **mN**

Described by: JW
Date: 14/10/2021
Type: QUADRAT

Landform: Gentle slope
Rock Type: Laterite

Vegetation: *Acacia acuminata tall open shrubland over Eremophila oldfieldii subsp. angustifolia mid sparse shrubland over Dodonaea stenozyga and Senna artemisioides subsp. filifolia low closed shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	300	15	
Austrostipa platychaeta	18	2	
Calandrinia baccata	10	2	
Dodonaea stenozyga	80	70	
Eremophila oldfieldii subsp. angustifolia	120	6	
Goodenia havilandii	18	1	
Haloragis trigonocarpa	18	1	
Lycium australe	10	0.1	
Maireana pentatropis	10	0.1	
Ptilotus exaltatus	25	1	
Ptilotus obovatus var. obovatus	40	1	
Senna artemisioides subsp. filifolia	100	5	
Thysanotus manglesianus	20	3	
Waitzia acuminata var. acuminata	15	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q29
Location MGA 50 328203 **mE** 6575013 **mN**

Described by: JW
Date: 14/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite

Vegetation: *Eucalyptus torquata low open woodland over Eremophila oldfieldii subsp. angustifolia, Senna artemisioides subsp. x artemisioides and Dodonaea stenozyga mid open shrubland over Ptilotus obovatus var. obovatus and Ptilotus exaltatus low sparse herbland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia jennerae	45	1	
Dodonaea stenozyga	150	3	
Eremophila oldfieldii subsp. angustifolia	200	6	
Eremophila parvifolia subsp. auricampi	35	3	
Eucalyptus torquata	400	5	
Olearia muelleri	25	1	
Ptilotus exaltatus	20	1	
Ptilotus obovatus var. obovatus	35	3	
Senna artemisioides subsp. x artemisioides	190	6	
Senna artemisioides subsp. filifolia	190	3	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q30
Location MGA 50 328220 **mE** 6575082 **mN**

Described by: JW
Date: 14/10/2021
Type: QUADRAT

Landform: Rocky plain
Rock Type: Laterite

Vegetation: *Allocasuarina ?huegeliana and Eucalyptus torquata low woodland over Santalum spicatum and Eremophila oppositifolia subsp. angustifolia mid sparse shrubland over Dodonaea stenozyga, Eremophila glabra subsp. glabra and Atriplex vesicaria low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Allocasuarina ?huegeliana	400	6	
Atriplex vesicaria	100	3	
Dodonaea stenozyga	80	6	
Eremophila glabra subsp. glabra	90	6	
Eremophila oppositifolia subsp. angustifolia	190	1	
Eucalyptus torquata	700	5	
Maireana pentatropis	25	0.1	
Ptilotus exaltatus	20	1	
Ptilotus obovatus var. obovatus	15	1	
Santalum spicatum	150	2	
Senna artemisioides subsp. filifolia	100	3	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R01
Location MGA 50 328967 **mE** 6577693 **mN**

Described by: JW
Date: 13/10/2021
Type: RELEVE

Landform: Plain
Rock Type: N/A

Vegetation: *Eucalyptus torquata low open woodland over Exocarpos aphyllus tall sparse shrubland over Eremophila parvifolia subsp. auricampi, Westringia rigida and Senna artemisioides subsp. filifolia low sparse shrubland*

Condition: Excellent **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eremophila parvifolia subsp. auricampi	32	3	
Eucalyptus torquata	400	5	
Exocarpos aphyllus	220	6	
Olearia muelleri	40	1	
Senna artemisioides subsp. filifolia	35	2	
Westringia rigida	35	3	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R02
Location MGA 50 328922 **mE** 6577745 **mN**

Described by: JW
Date: 13/10/2021
Type: RELEVE

Landform: Plain
Rock Type: N/A

Vegetation: *Eucalyptus torquata low woodland over Eremophila interstans subsp. interstans mid sparse shrubland over Senna artemisioides subsp. filifolia, Olearia muelleri and Westringia rigida low open shrubland*

Condition: Excellent **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eremophila georgei	28	0.1	
Eremophila interstans subsp. interstans	200	4	
Eucalyptus torquata	500	16	
Olearia muelleri	25	4	
Senna artemisioides subsp. filifolia	40	6	
Westringia rigida	25	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R03
Location MGA 50 329002 **mE** 6577925 **mN**

Described by: JW
Date: 13/10/2021
Type: RELEVE

Landform: Plain
Rock Type: Laterite

Vegetation: *Eucalyptus torquata low open woodland over Eremophila alternifolia tall sparse shrubland over Dodonaea stenozyga and Eremophila oldfieldii subsp. angustifolia mid sparse shrubland*

Condition: Excellent **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia jennerae	60	2	
Dodonaea stenozyga	120	5	
Eremophila alternifolia	210	2	
Eremophila oldfieldii subsp. angustifolia	110	5	
Eucalyptus torquata	400	2	
Maireana tomentosa	25	1	
Westringia rigida	25	2	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R04
Location MGA 50 326478 **mE** 6577408 **mN**

Described by: JW
Date: 13/10/2021
Type: RELEVE

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eremophila oldfieldii subsp. angustifolia tall open shrubland over Senna artemisioides subsp. x artemisioides and Senna artemisioides subsp. filifolia mid open shrubland over Ptilotus obovatus var. obovatus low open herbland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Dodonaea stenozyga	100	12	
Enchylaena tomentosa var. tomentosa	45	1	
Eremophila oldfieldii subsp. angustifolia	250	15	
Eremophila parvifolia subsp. auricampi	25	1	
Ptilotus obovatus var. obovatus	45	28	
Senna artemisioides subsp. x artemisioides	120	10	
Senna artemisioides subsp. filifolia	110	6	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R05
Location MGA 50 326536 **mE** 6577327 **mN**

Described by: JW
Date: 13/10/2021
Type: RELEVE

Landform: Mid slope
Rock Type: N/A

Vegetation: *Eucalyptus torquata and Eucalyptus salmonophloia low woodland over Exocarpos aphyllus mid sparse shrubland over Senna artemisioides subsp. filifolia and Senna artemisioides subsp. x artemisioides low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eucalyptus salmonophloia	500	10	
Eucalyptus torquata	400	5	
Exocarpos aphyllus	140	2	
Senna artemisioides subsp. x artemisioides	45	1	
Senna artemisioides subsp. filifolia	90	11	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R09
Location MGA 50 326358 **mE** 6577538 **mN**

Described by: JW
Date: 14/10/2021
Type: RELEVE

Landform: Plain
Rock Type: Laterite

Vegetation: *Eucalyptus celastroides and Eucalyptus clelandiorum low woodland over Atriplex vesicaria low sparse shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex vesicaria	40	1	
Eucalyptus celastroides	400	6	
Eucalyptus clelandiorum	400	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R10
Location MGA 50 326982 **mE** 6578150 **mN**

Described by: JW
Date: 14/10/2021
Type: RELEVE

Landform: Undulating plain
Rock Type: N/A

Vegetation: *Eucalyptus clelandiorum low open woodland over Senna artemisioides subsp. x artemisioides, Atriplex vesicaria and Eremophila interstans subsp. interstans low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex vesicaria	28	1	
Eremophila interstans subsp. interstans	45	1	
Eucalyptus clelandiorum	1000	5	
Senna artemisioides subsp. x artemisioides	35	10	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R11
Location MGA 50 327829 **mE** 6578083 **mN**

Described by: JW
Date: 14/10/2021
Type: RELEVE

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eucalyptus torquata mid open woodland over Eremophila interstans subsp. interstans mid open shrubland over Senna artemisioides subsp. x artemisioides, Senna artemisioides subsp. filifolia and Acacia jennerae low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia jennerae	10	3	
Eremophila interstans subsp. interstans	150	16	
Eucalyptus torquata	1500	5	
Olearia muelleri	35	2	
Senna artemisioides subsp. x artemisioides	40	5	
Senna artemisioides subsp. filifolia	25	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R13
Location MGA 50 327488 **mE** 6575973 **mN**

Described by: JW
Date: 14/10/2021
Type: RELEVE

Landform: Undulating plain
Rock Type: N/A

Vegetation: *Eucalyptus clelandiorum, Eucalyptus salmonophloia and Eucalyptus griffithsii low woodland over Eremophila interstans subsp. interstans and Eremophila oldfieldii subsp. angustifolia tall open shrubland over Atriplex nummularia subsp. spathulata and Dodonaea stenozyga low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex nummularia subsp. spathulata	45	11	
Dodonaea stenozyga	10	6	
Eremophila interstans subsp. interstans	220	11	
Eremophila oldfieldii subsp. angustifolia	200	10	
Eucalyptus clelandiorum	500	6	
Eucalyptus griffithsii	300	5	
Eucalyptus salmonophloia	400	6	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q01
Location MGA 50 326721 **mE** 6571821 **mN**

Described by: JW
Date: 15/11/2021
Type: QUADRAT

Landform: Scree slope drain line
Rock Type: Laterite

No photo available

Vegetation: *Eucalyptus loxophleba subsp. lissophloia and Eucalyptus campaspe low open woodland over Eremophila oldfieldii subsp. angustifolia mid sparse shrubland over Dodonaea adenophora and Olearia muelleri low sparse shrubland*
Condition: Good **Disturbance Type:** Fauna tracks/scats,Infrastructure

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Dodonaea adenophora	35	1	
Eremophila glabra subsp. glabra	5	0.1	
Eremophila oldfieldii subsp. angustifolia	130	2	
Eucalyptus campaspe	300	1	
Eucalyptus loxophleba subsp. lissophloia	300	2	
Maireana georgei	15	0.1	
Olearia muelleri	25	0.5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q02
Location MGA 50 324588 **mE** 6571695 **mN**

Described by: BD,SW
Date: 15/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Ironstone

Vegetation: *Eucalyptus salmonophloia low woodland over Melaleuca ?hamata and Eremophila oppositifolia subsp. angustifolia tall open shrubland over Olearia muelleri low sparse shrubland*

Condition: Very Good **Disturbance Type:** Litter

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	40	0.1	
Acacia hemiteles	160	1	
Enchylaena tomentosa var. tomentosa	40	0.1	
Eremophila oppositifolia subsp. angustifolia	250	4	
Eremophila parvifolia subsp. auricampi	60	0.1	
Eucalyptus salmonophloia	650	12	
Exocarpos aphyllus	150	0.5	
Melaleuca ?hamata	300	11	
Olearia muelleri	45	5	
Olearia pimeleoides	30	0.1	
Pimelea microcephala subsp. microcephala	50	0.1	
Ptilotus obovatus var. obovatus	30	0.1	
Scaevola spinescens	120	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q03
Location MGA 50 327534 **mE** 6572097 **mN**

Described by: JW
Date: 15/11/2021
Type: QUADRAT

Landform: Drainage line
Rock Type: Laterite

No photo available

Vegetation: *Atriplex ?vesicaria and Senna artemisioides subsp. x artemisioides low sparse shrubland*

Condition: Good **Disturbance Type:** Vehicle tracks

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	100	5	
Eremophila forrestii	20	0.1	
Eremophila scoparia	130	0.1	
Maireana georgei	5	0.1	
Senna artemisioides subsp. x artemisioides	60	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q04
Location MGA 50 324603 **mE** 6571566 **mN**

Described by: BD,SW
Date: 15/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Ironstone

Vegetation: *Eucalyptus ?ravida low open forest over Eremophila interstans subsp. interstans, Melaleuca ?hamata and Melaleuca pauperiflora subsp. fastigiata tall open shrubland over Triodia desertorum low sparse hummock grassland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	170	0.1	
Acacia hemiteles	140	0.1	
Atriplex nummularia subsp. spathulata	35	0.1	
Dodonaea lobulata	100	0.1	
Eremophila interstans subsp. interstans	210	11	
Eremophila oppositifolia subsp. angustifolia	110	0.1	
Eremophila parvifolia subsp. auricampi	30	0.1	
Eucalyptus ?ravida	550	35	
Exocarpos aphyllus	90	0.1	
Halgania andromedifolia	70	6	
Maireana georgei	30	0.1	
Melaleuca ?hamata	250	2	
Melaleuca pauperiflora subsp. fastigiata	350	1	
Myoporum platycarpum subsp. platycarpum	210	1	
Olearia muelleri	30	0.1	
Phebalium laevigatum	120	1	
Scaevola spinescens	45	5	
Sclerolaena fusiformis	10	0.1	
Triodia desertorum	25	2	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q05
Location MGA 50 327403 **mE** 6572169 **mN**

Described by: JW
Date: 15/11/2021
Type: QUADRAT

Landform: Scree slope minor drain No photo available
Rock Type: Laterite

Vegetation: *Eucalyptus campaspe low open woodland over Eremophila oldfieldii subsp. angustifolia tall open shrubland over Dodonaea stenozyga, Alyxia buxifolia and Eremophila glabra subsp. glabra low open shrubland*
Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Alyxia buxifolia	70	1	
Dodonaea stenozyga	90	15	
Eremophila glabra subsp. glabra	100	1	
Eremophila oldfieldii subsp. angustifolia	200	15	
Eucalyptus campaspe	200	1	
Maireana georgei	15	0.1	
Olearia muelleri	20	0.1	
Ptilotus obovatus var. obovatus	35	5	
Senna artemisioides subsp. filifolia	110	10	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q06
Location MGA 50 324605 **mE** 6571453 **mN**

Described by: BD,SW
Date: 15/11/2021
Type: QUADRAT

Landform: Low rise
Rock Type: Ironstone,Quartz

Vegetation: *Eucalyptus clelandiorum and Eucalyptus ?ravida low open woodland over Eremophila oppositifolia subsp. angustifolia and Myoporum platycarpum subsp. platycarpum mid open shrubland over Scaevola spinescens, Dodonaea lobulata and Phebalium laevigatum low open shrubland*

Condition: Good **Disturbance Type:** Litter,Historical Clearing

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	120	0.1	
Acacia tetragonophylla	150	0.1	
Atriplex nummularia subsp. spathulata	120	0.1	
Dodonaea lobulata	100	1	
Eremophila oppositifolia subsp. angustifolia	140	8	
Eremophila parvifolia subsp. auricampi	30	0.1	
Eucalyptus ?ravida	450	2	
Eucalyptus clelandiorum	700	5	
Halgania andromedifolia	100	0.1	
Maireana georgei	15	0.1	
Myoporum platycarpum subsp. platycarpum	190	4	
Olearia muelleri	30	0.5	
Phebalium laevigatum	80	1	
Ptilotus obovatus var. obovatus	30	0.1	
Scaevola spinescens	90	20	
Solanum lasiophyllum	20	0.1	
Triodia desertorum	30	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q07
Location MGA 50 327549 **mE** 6571711 **mN**

Described by: JW
Date: 15/11/2021
Type: QUADRAT

Landform: Scree slope
Rock Type: Laterite

No photo available

Vegetation: *Eremophila interstans subsp. interstans tall open shrubland over Dodonaea stenozyga, Senna artemisioides subsp. filifolia and Alyxia buxifolia mid open shrubland over Maireana georgei low sparse chenopod shrubland*
Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Alyxia buxifolia	110	1	
Cheilanthes sieberi subsp. sieberi	25	0.1	
Dodonaea stenozyga	170	5	
Eremophila interstans subsp. interstans	250	15	
Maireana georgei	15	2	
Malvaceae sp.	5	0.1	
Senna artemisioides subsp. filifolia	190	5	
Solanum cleistogamum	15	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q08
Location MGA 50 324706 **mE** 6571242 **mN**

Described by: BD,SW
Date: 15/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Ironstone,Quartz

Vegetation: *Eucalyptus clelandiorum and Eucalyptus salmonophloia mid open woodland over Eremophila interstans subsp. interstans mid sparse shrubland over Maireana trichoptera, Atriplex ?vesicaria and Sclerolaena fusiformis low sparse chenopod shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	30	1	
Atriplex nummularia subsp. spathulata	100	0.1	
Eremophila interstans subsp. interstans	160	2	
Eremophila parvifolia subsp. auricampi	40	1	
Eucalyptus clelandiorum	1100	2	
Eucalyptus salmonophloia	1100	2	
Exocarpos aphyllus	40	0.1	
Maireana georgei	15	0.1	
Maireana trichoptera	8	2	
Olearia muelleri	35	0.1	
Ptilotus obovatus var. obovatus	40	0.1	
Scaevola spinescens	80	1	
Sclerolaena diacantha	10	0.5	
Sclerolaena fusiformis	5	1	
Senna artemisioides subsp. filifolia	100	0.1	
Senna stowardii	60	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q09
Location MGA 50 327372 **mE** 6571654 **mN**

Described by: JW
Date: 15/11/2021
Type: QUADRAT

Landform: Slope
Rock Type: Laterite

No photo available

Vegetation: *Eremophila oldfieldii subsp. angustifolia tall open shrubland over Dodonaea stenozyga and Acacia acuminata mid sparse shrubland over Ptilotus obovatus var. obovatus and Cheilanthes sieberi subsp. sieberi low sparse herbland*
Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	140	2	
Cheilanthes sieberi subsp. sieberi	35	0.5	
Dodonaea stenozyga	200	10	
Eremophila oldfieldii subsp. angustifolia	250	25	
Ptilotus obovatus var. obovatus	25	10	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q10
Location MGA 50 324887 **mE** 6571294 **mN**

Described by: BD,SW
Date: 15/11/2021
Type: QUADRAT

Landform: Drainage line
Rock Type: Calcrete,Ironstone,Quartz

Vegetation: *Eucalyptus salubris low woodland over Eremophila oldfieldii subsp. angustifolia, Dodonaea lobulata and Eremophila glabra subsp. glabra mid open shrubland over Atriplex ?vesicaria low sparse chenopod shrubland*

Condition: Very Good **Disturbance Type:** Litter

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	40	3	
Atriplex nummularia subsp. spathulata	150	0.1	
Dodonaea lobulata	130	4	
Eremophila glabra subsp. glabra	150	4	
Eremophila interstans subsp. interstans	210	0.1	
Eremophila oldfieldii subsp. angustifolia	180	11	
Eremophila parvifolia subsp. auricampi	50	0.1	
Eucalyptus salubris	900	20	
Exocarpos aphyllus	150	0.1	
Maireana georgei	30	0.1	
Maireana trichoptera	10	0.1	
Olearia muelleri	35	0.1	
Ptilotus exaltatus	3	0.1	
Scaevola spinescens	100	0.1	
Sclerolaena obliquicuspis	10	0.1	
Senna artemisioides subsp. filifolia	150	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q11
Location MGA 50 326763 **mE** 6571675 **mN**

Described by: JW
Date: 15/11/2021
Type: QUADRAT

Landform: Drainage line
Rock Type: Granite,Laterite,Quartz

Vegetation: *Eucalyptus oleosa subsp. oleosa low woodland over Eremophila interstans subsp. interstans mid sparse shrubland over Dodonaea stenozyga, Acacia jennerae and Eremophila glabra subsp. glabra low sparse shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia jennerae	35	1	
Dodonaea stenozyga	38	5	
Eremophila glabra subsp. glabra	45	1	
Eremophila interstans subsp. interstans	200	1	
Eucalyptus oleosa subsp. oleosa	500	15	
Maireana georgei	20	0.1	
Olearia muelleri	40	1	
Ptilotus exaltatus	15	0.1	
Ptilotus obovatus var. obovatus	20	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q12
Location MGA 50 325065 **mE** 6571260 **mN**

Described by: BD,SW
Date: 15/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Ironstone,Laterite,Quartz

Vegetation: *Eucalyptus salmonophloia mid woodland over Senna artemisioides subsp. filifolia mid isolated shrubs*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eremophila interstans subsp. interstans	400	0.1	
Eremophila parvifolia subsp. auricampi	25	0.1	
Eucalyptus salmonophloia	1500	25	
Senna artemisioides subsp. filifolia	150	0.5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q13
Location MGA 50 327631 **mE** 6571898 **mN**

Described by: JW
Date: 16/11/2021
Type: QUADRAT

Landform: Ridge crest
Rock Type: Laterite

Vegetation: *Eucalyptus oldfieldii low open woodland over Dodonaea stenozyga mid sparse shrubland over Atriplex vesicaria, Senna artemisioides subsp. filifolia and Maireana pentatropis low shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex vesicaria	35	15	
Dodonaea stenozyga	110	8	
Eucalyptus oldfieldii	300	5	
Maireana pentatropis	5	5	
Olearia muelleri	20	0.1	
Ptilotus obovatus var. obovatus	15	6	
Senna artemisioides subsp. filifolia	45	15	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q14
Location MGA 50 325050 **mE** 6570941 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Ironstone

Vegetation: *Acacia collegialis and Eremophila oldfieldii subsp. angustifolia tall sparse shrubland over Dodonaea lobulata and Eremophila alternifolia mid sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia collegialis	400	6	
Acacia tetragonophylla	100	0.1	
Chenopodium curvispicatum	10	0.1	
Dodonaea lobulata	180	5	
Eremophila alternifolia	190	4	
Eremophila oldfieldii subsp. angustifolia	250	1	
Maireana georgei	20	0.1	
Maireana trichoptera	8	0.1	
Ptilotus obovatus var. obovatus	25	0.1	
Rhagodia drummondii	5	0.1	
Sclerolaena diacantha	5	0.1	
Sclerolaena fusiformis	10	0.1	
Sida ?petrophila	15	0.1	
Solanum lasiophyllum	10	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q15
Location MGA 50 327026 **mE** 6571767 **mN**

Described by: JW
Date: 16/11/2021
Type: QUADRAT

Landform: Lower slope
Rock Type: Laterite

Vegetation: *Eucalyptus clelandiorum and Eucalyptus oldfieldii low open woodland over Atriplex ?vesicaria and Eremophila interstans subsp. interstans mid shrubland over Dodonaea stenozyga, Olearia muelleri and Maireana pentatropis low open shrubland*

Condition: Good **Disturbance Type:** Fauna tracks/scats,Historical Clearing

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	120	35	
Dodonaea stenozyga	90	6	
Eremophila interstans subsp. interstans	190	20	
Eucalyptus clelandiorum	400	2	
Eucalyptus oldfieldii	60	2	
Maireana georgei	5	0.1	
Maireana pentatropis	20	1	
Olearia muelleri	20	5	
Ptilotus obovatus var. obovatus	15	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q16
Location MGA 50 324948 **mE** 6570710 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Ironstone

Vegetation: *Eucalyptus griffithsii mid woodland over Eremophila oldfieldii subsp. angustifolia tall sparse shrubland over Eremophila interstans subsp. interstans mid sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	30	0.1	
Dodonaea lobulata	80	1	
Eremophila glabra subsp. glabra	40	0.5	
Eremophila interstans subsp. interstans	180	3	
Eremophila oldfieldii subsp. angustifolia	500	2	
Eucalyptus griffithsii	1100	25	
Maireana trichoptera	20	0.1	
Olearia muelleri	40	1	
Ptilotus obovatus var. obovatus	25	0.1	
Rhagodia drummondii	20	0.1	
Senna artemisioides subsp. filifolia	40	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q17
Location MGA 50 327349 **mE** 6571149 **mN**

Described by: JW
Date: 16/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite,Sandstone,Shale

Vegetation: *Atriplex vesicaria, Maireana georgei and Maireana pentatropis low chenopod shrubland over *Asphodelus fistulosus low sparse herbland*

Condition: Poor **Disturbance Type:** Vehicle tracks,Fauna tracks/scats,Historical Clearing,Infrastructure

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
**Asphodelus fistulosus*	35	10	
Atriplex vesicaria	100	26	
Maireana georgei	10	15	
Maireana pentatropis	20	10	
**Salvia verbenaca*	10	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q18
Location MGA 50 324668 **mE** 6570076 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: QUADRAT

Landform: Hilltop
Rock Type: Calcrete,Ironstone

Vegetation: *Acacia collegialis and Eremophila oldfieldii subsp. angustifolia tall sparse shrubland over Dodonaea lobulata mid sparse shrubland over Senna artemisioides subsp. filifolia low sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia collegialis	350	5	
Atriplex nummularia subsp. spathulata	140	0.1	
Dodonaea lobulata	140	5	
Enchylaena tomentosa var. tomentosa	40	0.1	
Eremophila oldfieldii subsp. angustifolia	350	5	
Maireana pentatropis	15	0.1	
Maireana trichoptera	15	0.1	
Ptilotus obovatus var. obovatus	25	1	
Santalum acuminatum	250	0.1	
Scaevola spinescens	130	0.1	
Senna artemisioides subsp. filifolia	15	2	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q19
Location MGA 50 328122 **mE** 6571915 **mN**

Described by: JW
Date: 16/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite

No photo available

Vegetation: *Eucalyptus salmonophloia low woodland over Eremophila interstans subsp. interstans mid sparse shrubland over Atriplex vesicaria and Atriplex sp. low open chenopod shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex sp.	35	5	
Atriplex vesicaria	100	20	
Eremophila interstans subsp. interstans	120	5	
Eucalyptus salmonophloia	1000	15	
Maireana georgei	15	0.1	
Salsola australis	5	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q20
Location MGA 50 324559 **mE** 6569671 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: QUADRAT

Landform: Upper slope
Rock Type: Ironstone

Vegetation: *Eucalyptus salmonophloia and Eucalyptus salubris mid open woodland over Eremophila interstans subsp. interstans and Eremophila oldfieldii subsp. angustifolia tall sparse shrubland over Senna artemisioides subsp. filifolia and Atriplex nummularia subsp. spathulata mid sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	25	0.1	
Atriplex nummularia subsp. spathulata	120	0.5	
Dodonaea lobulata	60	0.1	
Eremophila glabra subsp. glabra	90	0.1	
Eremophila interstans subsp. interstans	350	3	
Eremophila oldfieldii subsp. angustifolia	250	1	
Eucalyptus salmonophloia	1200	3	
Eucalyptus salubris	1100	2	
Maireana ?georgei	15	0.1	
Maireana pentatropis	25	0.1	
Maireana sedifolia	100	0.5	
Maireana trichoptera	15	0.1	
Olearia muelleri	30	0.1	
Ptilotus obovatus var. obovatus	15	0.1	
Scaevola spinescens	30	0.1	
Sclerolaena fusiformis	15	0.1	
Senna artemisioides subsp. filifolia	130	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q21
Location MGA 50 327523 **mE** 6573455 **mN**

Described by: JW
Date: 16/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila oldfieldii subsp. angustifolia and Eremophila interstans subsp. interstans tall open shrubland over Senna artemisioides subsp. filifolia and Dodonaea stenozyga mid sparse shrubland*

Condition: Good **Disturbance Type:** Vehicle tracks,Litter

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Dodonaea stenozyga	120	2	
Eremophila interstans subsp. interstans	220	5	
Eremophila oldfieldii subsp. angustifolia	290	10	
Eucalyptus griffithsii	500	1	
Maireana ?marginata	30	2	
Maireana georgei	15	1	
Olearia muelleri	25	1	
Ptilotus obovatus var. obovatus	30	10	
Senna artemisioides subsp. filifolia	120	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q22
Location MGA 50 324398 **mE** 6569324 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Ironstone

Vegetation: *Acacia collegialis and Eremophila oldfieldii subsp. angustifolia tall open shrubland over Ptilotus obovatus var. obovatus and *Salvia verbenaca low herbland*

Condition: Good **Disturbance Type:** Grazing,Litter,Fauna tracks/scats,Historical Clearing

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia collegialis	400	8	
Enchylaena tomentosa var. tomentosa	40	0.1	
Enneapogon caerulescens	4	0.1	
Eremophila oldfieldii subsp. angustifolia	350	4	
Hibiscus sturtii var. grandiflorus	15	0.1	
Maireana trichoptera	20	0.1	
Ptilotus obovatus var. obovatus	35	35	
**Salvia verbenaca*	30	0.5	
Sclerolaena fusiformis	15	0.1	
Sida petrophila	30	4	
Solanum cleistogamum	10	0.1	
Solanum lasiophyllum	25	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q23
Location MGA 50 327250 **mE** 6573660 **mN**

Described by: JW
Date: 16/11/2021
Type: QUADRAT

Landform: Mud slope scree
Rock Type: Laterite

Vegetation: *Eucalyptus torquata low open woodland over Eremophila oldfieldii subsp. angustifolia and Acacia tetragonophylla tall open shrubland over Dodonaea stenozyga, Senna artemisioides subsp. filifolia and Alyxia buxifolia mid shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia tetragonophylla	250	1	
Alyxia buxifolia	130	1	
Dodonaea stenozyga	190	45	
Eremophila oldfieldii subsp. angustifolia	250	15	
Eucalyptus torquata	900	5	
Senna artemisioides subsp. filifolia	170	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q24
Location MGA 50 324535 **mE** 6569030 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Calcrete,Ironstone

Vegetation: *Eucalyptus salmonophloia mid open woodland over Atriplex nummularia subsp. spathulata low sparse chenopod shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	15	0.1	
Atriplex nummularia subsp. spathulata	90	5	
Eucalyptus salmonophloia	1200	6	
Maireana pentatropis	20	0.1	
Maireana trichoptera	10	0.1	
Senna artemisioides subsp. filifolia	50	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q25
Location MGA 50 326779 **mE** 6572716 **mN**

Described by: JW
Date: 16/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite,Limestone,Quartz

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila glabra subsp. glabra, Atriplex vesicaria and Maireana georgei low shrubland over Osteocarpum salsuginosum low sparse herbland*

Condition: Poor,Very Poor **Disturbance Type:** Weeds,Vehicle tracks,Litter,Historical Clearing,Infrastructure

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?holocarpa	35	5	
Atriplex vesicaria	38	15	
Enneapogon caerulescens	5	0.1	
Eremophila glabra subsp. glabra	35	30	
Eucalyptus griffithsii	400	2	
Maireana georgei	20	15	
Maireana pentatropis	25	1	
Maireana tomentosa	20	5	
Osteocarpum salsuginosum	15	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q26
Location MGA 50 325151 **mE** 6568826 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: QUADRAT

Landform: Undulating plain
Rock Type: Ironstone

Vegetation: *Eucalyptus salmonophloia and Eucalyptus salubris mid woodland over Senna artemisioides subsp. filifolia mid isolated shrubs over Atriplex ?vesicaria low isolated chenopod shrubs*

Condition: Very Good **Disturbance Type:** Historical Clearing

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	40	0.5	
Dodonaea lobulata	50	0.1	
Eremophila parvifolia subsp. auricampi	40	0.1	
Eucalyptus salmonophloia	1200	15	
Eucalyptus salubris	1100	5	
Senna artemisioides subsp. filifolia	120	0.5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q27
Location MGA 50 326933 **mE** 6578601 **mN**

Described by: JW
Date: 17/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite,Quartz

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila oldfieldii subsp. angustifolia mid open shrubland over Dodonaea stenozyga, Eremophila glabra subsp. glabra and Santalum spicatum mid open shrubland over Atriplex vesicaria, Exocarpos aphyllus and Pittosporum angustifolium low sparse shrubland*

Condition: Good **Disturbance Type:** Vehicle tracks

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	42	0.5	
Atriplex vesicaria	60	5	
Dodonaea stenozyga	200	20	
Eremophila glabra subsp. glabra	110	1	
Eremophila oldfieldii subsp. angustifolia	250	20	
Eucalyptus griffithsii	500	1	
Exocarpos aphyllus	100	1	
Lycium australe	40	0.5	
Maireana georgei	20	0.5	
Pittosporum angustifolium	60	1	
Ptilotus obovatus var. obovatus	30	2	
Santalum spicatum	170	1	
Senna artemisioides subsp. filifolia	40	0.5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q28
Location MGA 50 325835 **mE** 6569465 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: QUADRAT

Landform: Drainage line
Rock Type: Ironstone

Vegetation: *Eucalyptus salubris mid open forest over Eremophila interstans subsp. interstans tall sparse shrubland over Atriplex nummularia subsp. spathulata mid sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	100	2	
Atriplex nummularia subsp. spathulata	120	2	
Dodonaea lobulata	200	0.1	
Eremophila interstans subsp. interstans	300	4	
Eremophila parvifolia subsp. auricampi	50	0.1	
Eucalyptus salubris	1100	35	
Maireana trichoptera	50	0.1	
Olearia muelleri	90	0.1	
Ptilotus obovatus var. obovatus	40	0.1	
Scaevola spinescens	80	0.1	
Sclerolaena diacantha	10	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q29
Location MGA 50 326944 **mE** 6579386 **mN**

Described by: JW
Date: 17/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Dolerite,Laterite,Quartz

No photo available

Vegetation: *Eucalyptus griffithsii low open woodland over Acacia hemiteles, Dodonaea stenozyga and Santalum spicatum mid shrubland over Atriplex vesicaria, Senna artemisioides subsp. filifolia and Olearia muelleri low open shrubland*
Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia hemiteles	140	15	
Alyxia buxifolia	35	1	
Atriplex vesicaria	70	5	
Dodonaea stenozyga	120	15	
Eucalyptus griffithsii	700	10	
Olearia muelleri	15	2	
Santalum spicatum	200	5	
Senna artemisioides subsp. filifolia	45	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q31
Location MGA 50 326956 **mE** 6579776 **mN**

Described by: JW
Date: 17/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite

No photo available

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila interstans subsp. interstans tall shrubland over Eremophila oppositifolia subsp. angustifolia, Exocarpos aphyllus and Eremophila glabra subsp. glabra mid sparse shrubland*
Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Abutilon cryptopetalum	38	0.1	
Acacia erinacea	40	0.5	
Acacia jennerae	50	5	
Alyxia buxifolia	40	15	
Dodonaea stenozyga	35	1	
Eremophila glabra subsp. glabra	110	0.5	
Eremophila interstans subsp. interstans	220	45	
Eremophila oppositifolia subsp. angustifolia	200	1	
Eremophila scoparia	48	0.1	
Eucalyptus griffithsii	500	5	
Exocarpos aphyllus	110	1	
Maireana trichoptera	10	0.1	
Olearia muelleri	20	0.5	
Senna artemisioides subsp. filifolia	35	0.5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q32
Location MGA 50 325641 **mE** 6569459 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Laterite,Quartz

Vegetation: *Eucalyptus websteriana subsp. websteriana low open woodland over Acacia collegialis tall open shrubland over Dodonaea lobulata low open shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia collegialis	450	11	
Austrostipa trichophylla	5	0.1	
Cheilanthes lasiophylla	5	0.1	
Cheilanthes sieberi subsp. sieberi	8	0.1	
Chrysocephalum puteale	10	0.1	
Dodonaea lobulata	100	13	
Enneapogon caerulescens	3	0.1	
Eremophila alternifolia	30	0.1	
Eremophila oldfieldii subsp. angustifolia	20	0.1	
Eucalyptus websteriana subsp. websteriana	300	1	
**Euphorbia drummondii*	5	0.1	
Goodenia havilandii	10	0.1	
Maireana trichoptera	10	0.1	
Olearia muelleri	35	0.1	
Ptilotus obovatus var. obovatus	20	1	
Scaevola spinescens	50	0.1	
Sida ?petrophila	10	0.1	
Solanum lasiophyllum	10	0.1	
Waitzia acuminata var. acuminata	10	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q33
Location MGA 50 324395 **mE** 6579552 **mN**

Described by: JW
Date: 17/11/2021
Type: QUADRAT

Landform: Ridge
Rock Type: Laterite

Vegetation: *Acacia collegialis tall open shrubland over Eremophila oldfieldii subsp. angustifolia mid sparse shrubland over Dodonaea stenozyga and Solanum lasiophyllum low open shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia collegialis	400	21	
Aristida contorta	5	0.1	
Dodonaea stenozyga	50	20	
Eremophila oldfieldii subsp. angustifolia	120	10	
Goodenia havilandii	15	0.1	
Solanum lasiophyllum	15	0.5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q34
Location MGA 50 325544 **mE** 6569645 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Laterite

Vegetation: *Eucalyptus oleosa subsp. oleosa low isolated trees over Acacia acuminata and Acacia collegialis tall open shrubland over Dodonaea lobulata and Eremophila georgei mid open shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	450	10	
Acacia collegialis	450	3	
Cheilanthes sieberi subsp. sieberi	5	0.1	
Dodonaea lobulata	120	11	
Eremophila georgei	120	1	
Eucalyptus oleosa subsp. oleosa	500	0.5	
Leichhardtia australis	300	0.1	
Ptilotus obovatus var. obovatus	15	0.1	
Senna artemisioides subsp. filifolia	130	0.1	
Solanum lasiophyllum	3	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q35
Location MGA 50 324374 **mE** 6579775 **mN**

Described by: JW
Date: 17/11/2021
Type: QUADRAT

Landform: MId slope
Rock Type: Laterite,Quartz

Vegetation: *Acacia acuminata tall open shrubland over Maireana triptera, Senna artemisioides subsp. filifolia and Dodonaea stenozyga low open shrubland over Ptilotus obovatus var. obovatus and Ptilotus polystachyus low sparse herbland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	400	28	
Cheilanthes lasiophylla	5	0.1	
Dodonaea stenozyga	45	3	
Eremophila glabra subsp. glabra	45	2	
Maireana triptera	25	5	
Ptilotus obovatus var. obovatus	15	1	
Ptilotus polystachyus	35	1	
Senna artemisioides subsp. filifolia	46	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q36
Location MGA 50 324947 **mE** 6578526 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: QUADRAT

Landform: Upper slope
Rock Type: Granite,Laterite

Vegetation: *Eucalyptus clelandiorum and Eucalyptus salmonophloia mid open woodland over Eremophila interstans subsp. interstans tall sparse shrubland over Eremophila parvifolia subsp. auricampi and Atriplex nummularia subsp. spathulata low sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	40	0.1	
Atriplex nummularia subsp. spathulata	80	0.5	
Cratystylis conocephala	40	0.1	
Eremophila interstans subsp. interstans	250	3	
Eremophila parvifolia subsp. auricampi	100	1	
Eucalyptus clelandiorum	1100	3	
Eucalyptus salmonophloia	1100	2	
Exocarpos aphyllus	100	0.1	
Maireana trichoptera	10	0.1	
Roepera ovata	5	0.1	
Scaevola spinescens	50	0.1	
Senna artemisioides subsp. filifolia	160	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q37
Location MGA 50 323658 **mE** 6579927 **mN**

Described by: JW
Date: 17/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite,Quartz

Vegetation: *Eucalyptus salmonophloia and Eucalyptus oleosa subsp. oleosa mid woodland over Eremophila interstans subsp. interstans and Atriplex ?vesicaria mid shrubland over Senna artemisioides subsp. filifolia, Chenopodium curvispicatum and Olearia muelleri low open shrubland*

Condition: Good **Disturbance Type:** Vehicle tracks

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	140	15	
Chenopodium curvispicatum	45	2	
Eremophila interstans subsp. interstans	200	25	
Eucalyptus oleosa subsp. oleosa	1300	2	
Eucalyptus salmonophloia	1500	15	
Maireana pentatropis	15	0.1	
Maireana sedifolia	45	1	
Olearia muelleri	35	2	
Senna artemisioides subsp. filifolia	35	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q38
Location MGA 50 324822 **mE** 6578130 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Laterite

Vegetation: *Acacia collegialis and Eremophila oldfieldii subsp. angustifolia tall open shrubland over Dodonaea lobulata and Eremophila georgei mid sparse shrubland over Ptilotus obovatus var. obovatus low isolated herbs*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia collegialis	450	20	
Aristida contorta	5	0.1	
Cheilanthes sieberi subsp. sieberi	5	0.1	
Dodonaea lobulata	100	7	
Eremophila georgei	130	0.5	
Eremophila oldfieldii subsp. angustifolia	230	2	
Goodenia havilandii	15	0.1	
Leichhardtia australis	30	0.1	
Ptilotus obovatus var. obovatus	30	0.5	
Santalum acuminatum	300	0.1	
Scaevola spinescens	45	0.1	
Sida ?petrophila	10	0.5	
Solanum lasiophyllum	10	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q39
Location MGA 50 323564 **mE** 6579153 **mN**

Described by: JW
Date: 17/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Ironstone,Laterite,Quartz

Vegetation: *Eucalyptus celastroides low woodland over Eremophila interstans subsp. interstans mid sparse shrubland over Maireana pentatropis, Atriplex vesicaria and Chenopodium curvispicatum low sparse chenopod shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex vesicaria	100	2	
Chenopodium curvispicatum	35	1	
Eremophila interstans subsp. interstans	120	10	
Eucalyptus celastroides	600	20	
Maireana pentatropis	25	5	
Olearia muelleri	35	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q40
Location MGA 50 324436 **mE** 6578315 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Laterite,Quartz

Vegetation: *Acacia collegialis tall open shrubland over Dodonaea lobulata and Eremophila georgei mid open shrubland over Ptilotus obovatus var. obovatus low isolated herbs*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia collegialis	450	15	
Acacia tetragonophylla	210	0.1	
Aristida contorta	10	0.1	
Cheilanthes lasiophylla	5	0.1	
Cheilanthes sieberi subsp. sieberi	8	0.1	
Dodonaea lobulata	170	10	
Eremophila georgei	140	3	
Eremophila oldfieldii subsp. angustifolia	50	0.1	
Goodenia havilandii	15	0.1	
Leichhardtia australis	10	0.1	
Ptilotus obovatus var. obovatus	15	0.5	
Santalum acuminatum	270	0.1	
Scaevola spinescens	120	0.1	
Solanum lasiophyllum	5	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q41
Location MGA 50 323554 **mE** 6579206 **mN**

Described by: JW
Date: 18/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite,Quartz

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila interstans subsp. interstans, Eremophila glabra subsp. glabra and Acacia hemiteles mid open shrubland over Tecticornia halocnemoides, Atriplex sp. and Maireana trichoptera low chenopod shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia hemiteles	160	3	
Atriplex sp.	25	5	
Eremophila glabra subsp. glabra	110	5	
Eremophila interstans subsp. interstans	140	15	
Eucalyptus griffithsii	1000	5	
Exocarpos aphyllus	180	1	
Frankenia ?fecunda	5	0.1	
Maireana trichoptera	20	5	
Senna artemisioides subsp. filifolia	60	2	
Tecticornia halocnemoides	100	25	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q42
Location MGA 50 323685 **mE** 6577907 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: QUADRAT

Landform: Footslope
Rock Type: Ironstone,Quartz

Vegetation: *Eremophila interstans subsp. interstans mid sparse shrubland over Tecticornia halocnemoides low open samphire shrubland*

Condition: Good **Disturbance Type:** Vehicle tracks

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	50	2	
Atriplex nummularia subsp. spathulata	90	1	
Eremophila interstans subsp. interstans	180	2	
Eremophila parvifolia subsp. auricampi	30	0.1	
Exocarpos aphyllus	30	0.1	
Frankenia ?fecunda	20	0.1	
Lawrencia repens	3	0.1	
Maireana trichoptera	10	0.1	
Ptilotus exaltatus	2	0.1	
Rhagodia drummondii	15	0.1	
Roepera ovata	8	0.1	
Sclerolaena fusiformis	5	0.1	
Tecticornia halocnemoides	90	11	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q43
Location MGA 50 323723 **mE** 6578705 **mN**

Described by: JW
Date: 18/11/2021
Type: QUADRAT

Landform: Ridge crwat
Rock Type: Ironstone,Laterite,Quartz

Vegetation: *Eucalyptus celastroides low woodland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eucalyptus celastroides	700	25	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R44
Location MGA 50 323751 **mE** 6577898 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: RELEVE

Landform: Cracking clay No photo available
Rock Type: Ironstone,Quartz

Vegetation: *Streptoglossa liatroides and Sclerolaena cuneata low sparse herbland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Goodenia pinnatifida	5	0.1	
Ptilotus exaltatus	25	0.1	
Sclerolaena cuneata	5	0.5	
Streptoglossa liatroides	2	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q45
Location MGA 50 323830 **mE** 6584592 **mN**

Described by: JW
Date: 18/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite,Quartz

No photo available

Vegetation: *Eremophila oldfieldii subsp. angustifolia tall sparse shrubland over Acacia acuminata and Senna artemisioides subsp. filifolia mid sparse shrubland over Atriplex vesicaria, Maireana pentatropis and Maireana georgei low sparse chenopod shrubland*
Condition: Poor **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	170	5	
Atriplex vesicaria	45	5	
Eremophila oldfieldii subsp. angustifolia	220	5	
Maireana georgei	15	0.5	
Maireana pentatropis	15	2	
Ptilotus exaltatus	25	5	
Ptilotus obovatus var. obovatus	35	1	
Rhodanthe chlorocephala subsp. rosea	5	0.1	
**Salvia verbenaca*	15	0.5	
Senna artemisioides subsp. filifolia	140	1	
Solanum lasiophyllum	20	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q46
Location MGA 50 324398 **mE** 6577581 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Ironstone,Quartz

Vegetation: *Eucalyptus salmonophloia mid open woodland over Eremophila interstans subsp. interstans tall sparse shrubland over Atriplex nummularia subsp. spathulata mid sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	50	2	
Atriplex nummularia subsp. spathulata	160	6	
Eremophila interstans subsp. interstans	250	1	
Eucalyptus salmonophloia	1300	7	
Maireana trichoptera	15	0.1	
Scaevola spinescens	30	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q48
Location MGA 50 324472 **mE** 6578839 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Granite,Ironstone,Quartz

Vegetation: *Eucalyptus salubris low open woodland over Eremophila oldfieldii subsp. angustifolia and Acacia collegialis tall sparse shrubland over Dodonaea lobulata and Senna artemisioides subsp. filifolia mid sparse shrubland*

Condition: Good **Disturbance Type:** Litter,Historical Clearing

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia collegialis	300	2	
Aristida contorta	5	0.1	
Dodonaea lobulata	130	4	
Eremophila oldfieldii subsp. angustifolia	250	4	
Eucalyptus salubris	600	1	
Maireana trichoptera	10	0.1	
Olearia muelleri	40	0.1	
Ptilotus obovatus var. obovatus	15	0.1	
Scaevola spinescens	50	1	
Senna artemisioides subsp. filifolia	150	3	
Trymalium myrtillus subsp. myrtillus	150	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q50
Location MGA 50 325838 **mE** 6579783 **mN**

Described by: BD,SW
Date: 18/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Ironstone,Quartz

Vegetation: *Acacia hemiteles, Casuarina pauper and Eremophila oldfieldii subsp. angustifolia tall sparse shrubland over Senna artemisioides subsp. filifolia, Acacia jennerae and Eremophila deserti mid sparse shrubland over Scaevola spinescens, Chenopodium curvispicatum and Maireana trichoptera low sparse shrubland*

Condition: Good **Disturbance Type:** Vehicle tracks,Fauna tracks/scats,Historical Clearing

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia hemiteles	230	4	
Acacia jennerae	130	2	
Aristida contorta	10	0.1	
Atriplex ?vesicaria	40	0.1	
Atriplex nummularia subsp. spathulata	330	0.1	
Austrostipa platychaeta	150	0.1	
**Carrichtera annua*	15	0.1	
Casuarina pauper	300	1	
Chenopodium curvispicatum	20	0.5	
Eremophila deserti	170	1	
Eremophila oldfieldii subsp. angustifolia	220	1	
Leichhardtia australis	100	0.1	
Maireana sedifolia	160	2	
Maireana tomentosa	5	0.1	
Maireana trichoptera	30	0.5	
Pimelea microcephala subsp. microcephala	190	1	
Pittosporum angustifolium	200	0.1	
Ptilotus obovatus var. obovatus	35	0.1	
Salsola australis	4	0.1	
**Salvia verbenaca*	25	0.1	
Scaevola spinescens	100	3	
Sclerolaena fusiformis	10	0.5	
Senna artemisioides subsp. filifolia	170	3	
Solanum nummularium	35	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q52
Location MGA 50 325464 **mE** 6579380 **mN**

Described by: BD,SW
Date: 18/11/2021
Type: QUADRAT

Landform: Claypan
Rock Type: Calcrete,Ironstone,Quartz

Vegetation: *Dodonaea lobulata and Eremophila interstans subsp. interstans mid sparse shrubland over Maireana trichoptera, Atriplex vesicaria and Maireana georgei low sparse chenopod shrubland over *Salvia verbenaca, Ptilotus exaltatus and Sclerolaena fusiformis low herbland*

Condition: Good **Disturbance Type:** Weeds,Vehicle tracks

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex vesicaria	50	1	
Calandrinia baccata	5	0.1	
**Carrichtera annua*	15	1	
**Centaurea melitensis*	25	0.1	
Chenopodium curvispicatum	30	0.1	
Dodonaea lobulata	150	4	
Dysphania melanocarpa forma leucocarpa	10	0.1	
Eremophila interstans subsp. interstans	180	1	
Lawrencia repens	5	1	
Maireana georgei	20	1	
Maireana trichoptera	40	3	
Monachather paradoxus	5	0.1	
**Oligocarpus calendulaceus*	5	0.1	
Ptilotus exaltatus	35	12	
Ptilotus obovatus var. obovatus	20	0.1	
**Salvia verbenaca*	20	15	
Sclerolaena fusiformis	8	5	
Senna artemisioides subsp. filifolia	150	0.1	
Solanum lasiophyllum	10	0.1	
Streptoglossa liatroides	5	3	
Vittadinia dissecta var. hirta	30	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q54
Location MGA 50 324779 **mE** 6583442 **mN**

Described by: BD,SW
Date: 18/11/2021
Type: QUADRAT

Landform: Undulating plain
Rock Type: Ironstone,Laterite

Vegetation: *Eucalyptus salmonophloia low open woodland over Eremophila oldfieldii subsp. angustifolia tall isolated shrubs over Senna artemisioides subsp. filifolia, Eremophila interstans subsp. interstans and Dodonaea lobulata mid open shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia tetragonophylla	170	0.1	
Aristida contorta	15	0.1	
Atriplex nummularia subsp. spathulata	120	0.1	
Dodonaea lobulata	100	2	
Eremophila glabra subsp. glabra	160	1	
Eremophila interstans subsp. interstans	160	3	
Eremophila oldfieldii subsp. angustifolia	250	0.5	
Eremophila parvifolia subsp. auricampi	130	1	
Eucalyptus salmonophloia	900	5	
Leichhardtia australis	150	0.1	
Maireana trichoptera	15	0.1	
Olearia muelleri	30	0.1	
Ptilotus obovatus var. obovatus	30	0.1	
Roepera ovata	5	0.1	
Scaevola spinescens	50	0.1	
Senna artemisioides subsp. filifolia	140	8	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R05
Location MGA 50 327540 **mE** 6571802 **mN**

Described by: JW
Date: 16/11/2021
Type: RELEVE

Landform: Minor creek line
Rock Type: Laterite

No photo available

Vegetation: *Eucalyptus torquata low woodland over Dodonaea stenozyga mid sparse shrubland over Ptilotus obovatus var. obovatus and Haloragis trigonocarpa low sparse herbland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Dodonaea stenozyga	110	5	
Eucalyptus torquata	400	20	
Haloragis trigonocarpa	40	2	
Ptilotus obovatus var. obovatus	25	6	
Senna artemisioides subsp. filifolia	48	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R06
Location MGA 50 327365 **mE** 6572989 **mN**

Described by: JW
Date: 16/11/2021
Type: RELEVE

Landform: Lake
Rock Type: N/A

Vegetation: **Schinus molle var. areira low woodland over Aristida contorta low grassland over *Heliotropium europaeum, Heliotropium curassavicum and *Sonchus asper low herbland*

Condition: Degraded **Disturbance Type:** Weeds,Grazing,Vehicle tracks,Litter,Fauna tracks/scats

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Aristida contorta	30	70	
Heliotropium curassavicum	18	1	
**Heliotropium europaeum*	2	40	
**Schinus molle var. areira*	300	15	
**Sonchus asper*	70	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R07
Location MGA 50 327376 **mE** 6570901 **mN**

Described by: JW
Date: 16/11/2021
Type: RELEVE

Landform: MId slope
Rock Type: Laterite

Vegetation: *Eucalyptus oleosa subsp. oleosa low woodland over Atriplex vesicaria low sparse chenopod shrubland over Heliotropium curassavicum low sparse herbland*

Condition: Good **Disturbance Type:** Vehicle tracks

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex vesicaria	60	10	
Eucalyptus oleosa subsp. oleosa	700	15	
Heliotropium curassavicum	40	10	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R09
Location MGA 50 327166 **mE** 6574087 **mN**

Described by: JW
Date: 16/11/2021
Type: RELEVE

Landform: Plain
Rock Type: Laterite

Vegetation: *Eucalyptus torquata and Eucalyptus griffithsii low woodland over Eremophila oldfieldii subsp. angustifolia and Santalum acuminatum tall open shrubland over Dodonaea stenozyga, Senna artemisioides subsp. filifolia and Alyxia buxifolia low shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Alyxia buxifolia	50	5	
Dodonaea stenozyga	80	25	
Eremophila oldfieldii subsp. angustifolia	300	25	
Eucalyptus griffithsii	800	2	
Eucalyptus torquata	1000	15	
Santalum acuminatum	220	2	
Senna artemisioides subsp. filifolia	90	18	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R11
Location MGA 50 325721 **mE** 6569452 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: RELEVE

Landform: Drainage line
Rock Type: Ironstone

Vegetation: *Eucalyptus salmonophloia mid woodland over Eremophila interstans subsp. interstans and Acacia collegialis tall open shrubland over Senna artemisioides subsp. filifolia and Dodonaea lobulata mid open shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	250	0.1	
Acacia collegialis	300	1	
Dodonaea lobulata	120	2	
Eremophila interstans subsp. interstans	250	20	
Eremophila oldfieldii subsp. angustifolia	250	0.1	
Eremophila parvifolia subsp. auricampi	40	0.1	
Eucalyptus salmonophloia	1200	20	
Olearia muelleri	40	0.1	
Ptilotus obovatus var. obovatus	40	0.1	
Senna artemisioides subsp. filifolia	150	15	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R13
Location MGA 50 324764 **mE** 6579229 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: RELEVE

Landform: Plain
Rock Type: Calcrete,Laterite

No photo available

Vegetation: *Maireana georgei mid sparse chenopod shrubland over Atriplex nummularia subsp. spathulata, Maireana tomentosa and Atriplex ?vesicaria low sparse chenopod shrubland over *Centaurea melitensis and Ptilotus obovatus var. obovatus low open herbland*

Condition: Very Poor **Disturbance Type:** Weeds,Vehicle tracks,Litter,Historical Clearing,Infrastructure

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	25	0.5	
Atriplex nummularia subsp. spathulata	20	1	
Atriplex quadrivalvata	15	0.1	
**Centaurea melitensis*	40	10	
Hibiscus solanifolius	120	0.1	
Maireana georgei	120	2	
Maireana tomentosa	30	1	
Ptilotus obovatus var. obovatus	35	10	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R15
Location MGA 50 324420 **mE** 6579488 **mN**

Described by: JW
Date: 17/11/2021
Type: RELEVE

Landform: Ridge crwst
Rock Type: Laterite,Quartz

Vegetation: *Eucalyptus campaspe and Eucalyptus oleosa subsp. oleosa low open forest over Senna artemisioides subsp. filifolia mid open shrubland over Olearia muelleri and Eremophila glabra subsp. glabra low open shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eremophila glabra subsp. glabra	90	1	
Eucalyptus campaspe	1000	25	
Eucalyptus oleosa subsp. oleosa	1000	15	
Olearia muelleri	28	10	
Senna artemisioides subsp. filifolia	200	18	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R17
Location MGA 50 323480 **mE** 6579368 **mN**

Described by: JW
Date: 17/11/2021
Type: RELEVE

Landform: Plain
Rock Type: Ironstone,Laterite

Vegetation: *Eucalyptus oleosa subsp. oleosa and Eucalyptus celastroides low woodland over Senna artemisioides subsp. filifolia and Eremophila interstans subsp. interstans low sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eremophila interstans subsp. interstans	35	0.5	
Eucalyptus celastroides	500	1	
Eucalyptus oleosa subsp. oleosa	700	10	
Olearia muelleri	25	0.1	
Senna artemisioides subsp. filifolia	60	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C3Q01
Location MGA 50 328133 **mE** 6574120 **mN**

Described by: JW
Date: 18/11/2021
Type: QUADRAT

Landform: Plai
Rock Type: Laterite

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila interstans subsp. interstans, Senna artemisioides subsp. filifolia and Acacia jennerae mid open shrubland over Alyxia buxifolia, Westringia rigida and Olearia muelleri low sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	120	1	
Acacia jennerae	140	1	
Alyxia buxifolia	90	2	
Eremophila interstans subsp. interstans	130	5	
Eucalyptus griffithsii	700	5	
Exocarpos aphyllus	150	1	
Maireana tomentosa	10	0.1	
Olearia muelleri	28	0.5	
Ptilotus exaltatus	15	0.1	
Senna artemisioides subsp. filifolia	120	5	
Westringia rigida	45	2	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C3Q02
Location MGA 50 328109 **mE** 6573080 **mN**

Described by: BD,SW
Date: 18/11/2021
Type: QUADRAT

Landform: Upper slope
Rock Type: Granite,Laterite

Vegetation: *Eucalyptus torquata low open forest over Dodonaea stenozyga low sparse shrubland*

Condition: Good **Disturbance Type:** Litter

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
?Enchylaena tomentosa	20	0.1	
Atriplex ?vesicaria	40	0.1	
Dodonaea lobulata	90	0.1	
Dodonaea stenozyga	80	3	
Eremophila interstans subsp. interstans	180	0.1	
Eremophila parvifolia subsp. auricampi	60	0.1	
Eucalyptus torquata	800	35	
Exocarpos aphyllus	40	0.1	
Maireana trichoptera	10	0.1	
Ptilotus obovatus var. obovatus	10	0.1	
Rytidosperma sp.	10	0.1	
Scaevola spinescens	50	0.1	
Solanum nummularium	5	0.1	
Trymalium myrtillus subsp. myrtillus	20	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C3Q02A
Location MGA 50 327861 **mE** 6573908 **mN**

Described by: JW
Date: 18/11/2021
Type: QUADRAT

Landform: Hill top
Rock Type: Granite,Ironstone,Laterite

Vegetation: *Eucalyptus torquata low open woodland over Dodonaea stenozyga, Acacia acuminata and Eremophila oldfieldii subsp. angustifolia mid open shrubland over Alyxia buxifolia and Senna artemisioides subsp. filifolia low sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	200	3	
Acacia dissona var. dissona	200	1	
Alyxia buxifolia	50	1	
Dodonaea stenozyga	110	12	
Eremophila oldfieldii subsp. angustifolia	150	3	
Eucalyptus torquata	1000	5	
Maireana georgei	5	0.1	
Senna artemisioides subsp. filifolia	70	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C3Q02B
Location MGA 50 327412 **mE** 6574092 **mN**

Described by: JW
Date: 18/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Ironstone,Laterite

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila oldfieldii subsp. angustifolia mid sparse shrubland over Atriplex vesicaria, Dodonaea stenozyga and Acacia dissona var. dissona low open shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia dissona var. dissona	25	1	
Acacia hemiteles	100	1	
Atriplex vesicaria	45	15	
Dodonaea stenozyga	25	5	
Eremophila interstans subsp. interstans	25	1	
Eremophila oldfieldii subsp. angustifolia	150	5	
Eucalyptus griffithsii	700	5	
Maireana pentatropis	15	0.1	
Maireana tomentosa	10	0.5	
Olearia muelleri	25	1	
Ptilotus obovatus var. obovatus	15	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C3Q06
Location MGA 50 327864 **mE** 6573343 **mN**

Described by: BD,SW
Date: 18/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Calcrete,Laterite

Vegetation: *Eucalyptus torquata low woodland over Eremophila interstans subsp. interstans tall sparse shrubland over Dodonaea stenozyga mid sparse shrubland*

Condition: Good **Disturbance Type:** Vehicle tracks,Fauna tracks/scats

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	50	0.1	
Atriplex nummularia subsp. spathulata	40	0.1	
Austrostipa platychaeta	80	0.1	
Dodonaea stenozyga	150	1	
Eremophila interstans subsp. interstans	370	1	
Eremophila parvifolia subsp. auricampi	30	0.1	
Eucalyptus torquata	800	15	
Maireana sedifolia	120	0.1	
Maireana tomentosa	5	0.1	
Maireana trichoptera	15	0.1	
Olearia muelleri	40	0.1	
Senna artemisioides subsp. filifolia	60	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C3R01
Location MGA 50 328239 **mE** 6574703 **mN**

Described by: JW
Date: 18/11/2021
Type: RELEVE

Landform: Plain
Rock Type: Laterite

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila interstans subsp. interstans tall open shrubland over Atriplex vesicaria and Exocarpos aphyllus mid open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Alyxia buxifolia	90	1	
Atriplex vesicaria	110	15	
Dianella revoluta var. divaricata	60	0.5	
Dodonaea stenozyga	15	0.5	
Eremophila glabra subsp. glabra	70	2	
Eremophila interstans subsp. interstans	220	15	
Eucalyptus griffithsii	1000	5	
Exocarpos aphyllus	130	5	
Maireana pentatropis	15	0.5	
Maireana trichoptera	20	0.1	
Olearia muelleri	15	0.5	
Pimelea spiculigera var. thesioides	20	0.1	
Ptilotus exaltatus	35	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C3R04
Location MGA 50 328218 **mE** 6573560 **mN**

Described by: BD,SW
Date: 18/11/2021
Type: RELEVE

Landform: Creek line
Rock Type: Granite,Quartz

Vegetation: *Eucalyptus salmonophloia mid open forest over Eremophila interstans subsp. interstans tall sparse shrubland over Acacia jennerae mid sparse shrubland*

Condition: Good **Disturbance Type:** Weeds,Vehicle tracks

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
?Pimelea sp.	170	0.1	
Acacia jennerae	150	5	
**Asphodelus fistulosus*	30	0.1	
Atriplex ?vesicaria	30	2	
Atriplex nummularia subsp. spathulata	50	1	
**Carrichtera annua*	20	0.1	
**Centaurea melitensis*	20	0.1	
Chloris truncata	30	0.1	
Eragrostis dielsii	3	0.1	
Eremophila interstans subsp. interstans	210	4	
Eremophila oldfieldii subsp. angustifolia	140	0.1	
Eucalyptus salmonophloia	1100	40	
Maireana trichoptera	20	0.1	
Olearia muelleri	40	0.1	
**Oligocarpus calendulaceus*	5	0.1	
Pittosporum angustifolium	210	0.1	
Ptilotus exaltatus	30	0.1	
Ptilotus obovatus var. obovatus	25	0.1	
Sclerolaena diacantha	5	0.1	
Senna artemisioides subsp. filifolia	120	0.1	
Vittadinia dissecta var. hirta	15	0.1	

Appendix F
Fauna Habitat Assessments

HABC01

Project:	4794 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	899984.8973525156	**Northing**	6572010.013459269
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	5 - 25%
Condition			
Quality	Good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Low (<10 m)	Open forest (50-80%)	*Acacia sp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*dodonaea sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*ptilotus sp.*

Fulcrum photo ID	42151a58-0510-40c7-b5b8-39f62d4c1f75,4ffc3568-888a-4c64-9f70-

HABC02

Project:	4795 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	899822.8621105128	**Northing**	6571973.766455285
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	25 - 50%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Acacia sp.*
Mid stratum	Mid (1-2 m)	Open mallee shrubland (20-50%)	
Ground stratum	Low (>0.5 m)	Open forbland (20-50%)	*ptilotus sp.*

Fulcrum photo ID	687a6808-3ad9-4430-9631-687bd7c191ca,3a9bdcb2-3829-4fc9-b373-

HABC03

Project:	4796 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	899951.8547312932	**Northing**	6571730.697303254
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Quartz
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown	**Surface stone size classes present**	0 - 5%
Condition			
Quality	Good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Hollows - trees,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*eucalyptus mallee*
Ground stratum	Low (>0.5 m)	Open forbland (20-50%)	*eremophila sp, salt Bush, acacia sp.*

Fulcrum photo ID	cae7ef5d-35d9-43c9-bff0-76d8079f5710,e1c8ac9f-dd84-4e1b-a0b8-

HABC04

Project:	4797 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	899917.5832372475	**Northing**	6571665.113011075
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Granite,Quartz
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	5 - 25%
Condition			
Quality	Good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Peeling bark,Rock crevices,Woody debris
Introduced fauna	Cattle		

Vegetation			
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	*Eremophila sp.*
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*ptilotus sp.*

Fulcrum photo ID	5e27f824-34b2-4807-bc1c-60a160cc8ad3,d582a71f-1bea-4caa-99e9-

HABC05

Project:	4798 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	900074.8952529589	**Northing**	6571739.672393914
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	0 - 5%
Condition			
Quality	Good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks,Weeds	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Forbland (50-80%)	*saltbush sp.*

Fulcrum photo ID	e29ce514-0173-433b-bb49-ef3ded5af200,1db3699d-1b8b-4cf9-950a-

HABC06

Project:	4799 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	900594.4049126134	**Northing**	6571695.699349251
Landform and soil		**Rock**	
Landform	Gorge	**Rock type/s**	Granite
Soil type	Clay	**Surface stone cover**	
Soil colour	Brown	**Surface stone size classes present**	0 - 5%
Condition			
Quality	Highly degraded	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Present
Disturbance	Clearing,Litter,Vehicle tracks	**Microhabitats**	Exfoliating rock
Introduced fauna	Goat		

Vegetation			
Upper stratum	Absent		
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Sparse tussock grassland (0.25-20%)	*eraharta sp.*

Fulcrum photo ID	7c25ab6a-4d43-4390-897a-cb707b353f57,7ba253fb-c9d3-4b40-885f-

HABC07

Project:	4800 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	901166.9975909423	**Northing**	6571815.560922004
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Granite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Burrows,Leaf litter,Peeling bark,Woody debris
Introduced fauna	Cattle,Rabbit		

Vegetation			
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	*Eucalyptus sp. and eremophila sp.*
Mid stratum	Low (0.5-1 m)	Shrubland and/or heathland (50-80%)	*dodonaea*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*saltbush and Ptilotus sp.*

Fulcrum photo ID	0103efbf-c7eb-4e3f-bb46-943ea4911830,ccb4b5f6-49b0-4d03-8017-

HABC08

Project:	4801 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	901301.0032407076	**Northing**	6571962.571508318
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Granite
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Grey,Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	Cattle		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*saltbush sp.*

Fulcrum photo ID	212d5260-a83c-4619-b069-494f4f980745,0b6d6cef-7222-4fa8-9bcc-

HABC09

Project:	4802 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	901682.8518081398	**Northing**	6571863.583170791
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Sandy clay	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Absent		

Fulcrum photo ID	117fc066-1e33-488f-b006-63d6e0f432e1,e1f0326e-d28b-470e-b3ef-

HABC10

Project:	4803 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	902022.5631623187	**Northing**	6572062.188234046
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Granite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Red	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*acacia sp. eremophila sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	

Fulcrum photo ID	b36a6fd3-4521-41ec-ba74-6fdeac4098bb,0044da98-5d6a-4f2e-9cba-

HABC11

Project:	4804 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	902400.9875870193	**Northing**	6571798.486756262
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Calcrete,Granite
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	Goat,Rabbit		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*eremophila sp. dodenea sp. acacia sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*eremophila*

Fulcrum photo ID	3c1c6583-ed7c-459a-93f5-8dd769a4d26c,4211c7c8-571a-4138-af6c-

HABC12

Project:	4805 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	902370.029827407	**Northing**	6571589.932107501
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Unknown
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	0 - 5%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	

Fulcrum photo ID	aef600dc-722f-4dd1-a355-599e69a6b123,e75ca763-a192-495f-a373-

HABC13

Project:	4806 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	900730.9056804918	**Northing**	6570131.034563001
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Granite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Red	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance		**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	Goat,Rabbit		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Acacia sp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*dodonaea sp.*
Ground stratum	Low (>0.5 m)	Isolated tussock grasses (<0.25%)	*grass species*

Fulcrum photo ID	58005a12-2165-49c3-b705-24e2a50985e8,0b2d1291-65d4-48da-b5d6

HABC14

Project:	4807 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	900889.8561838119	**Northing**	6569940.604672145
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Grey	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp. salt bush*
Ground stratum	Mid (0.5-1 m)	Open forbland (20-50%)	*salt bush sp.*

Fulcrum photo ID	3b56a64c-51c9-4e00-bdc1-f54d4301f218,c0fddb0c-66e8-40b3-9c48-

HABC15

Project:	4808 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	901542.5074801195	**Northing**	6568846.8061696505
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Calcrete,Granite
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Red	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*acacia sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*ptilotus sp*

Fulcrum photo ID	bfb61e82-be29-4f8f-a414-761f945af8e4,e6e2629f-1f45-4bcd-9213-

HABC16

Project:	4809 Coolgardie Biological Spring Survey		
Date	2021-10-13	**Personnel**	LC
Easting	902295.8342707243	**Northing**	6571439.575077539
Landform and soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Erosion	**Microhabitats**	Hollows - trees,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*Saltbush sp.*

Fulcrum photo ID	b70c7eb9-827e-46df-b8e4-5e4e110d293a,85f73721-6a97-4980-94c7-

HABC17

Project:	4810 Coolgardie Biological Spring Survey		
Date	2021-10-13	**Personnel**	LC
Easting	901495.8347967644	**Northing**	6571719.769933704
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Orange,Yellow	**Surface stone size classes present**	0 - 5%
Condition			
Quality	Good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Burrows,Hollows - logs,Hollows - trees,Leaf litter,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*ptilotus sp. and herb sp.*

Fulcrum photo ID	372a2bcc-d839-41ff-9db2-d990a2431994,cd2c96ca-6b1d-49e3-b273-

HABC18

Project:	4811 Coolgardie Biological Spring Survey		
Date	2021-10-13	**Personnel**	LC
Easting	899905.7739034619	**Northing**	6571300.257774439
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange,Red	**Surface stone size classes present**	25 - 50%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Isolated trees (<0.25%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*dodenea sp. eremophila sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*ptilotus sp.*

Fulcrum photo ID	3663874c-d46e-438f-8c20-f9744960ca60,30a5a95b-d86a-4c39-8c3b-

HABC19

Project:	4812 Coolgardie Biological Spring Survey		
Date	2021-10-13	**Personnel**	LC
Easting	899738.7645235118	**Northing**	6571320.002878793
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Granite,Quartz
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*saltbush sp. and Ptilotus sp.*

Fulcrum photo ID	3996f487-e2d9-4d38-9be8-65219fc9ea13,d5e4af84-5d54-464a-b161-

HABC20

Project:	4813 Coolgardie Biological Spring Survey		
Date	2021-10-14	**Personnel**	LC
Easting	900350.4372829349	**Northing**	6571342.937353729
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Grey	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Erosion,Litter,Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*saltbush sp. and herb sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*saltbush sp.*

Fulcrum photo ID	cfd77415-c024-4198-bd3a-e011a5fb5404,15466c44-d7ac-4902-a088-

HABC21

Project:	4814 Coolgardie Biological Spring Survey		
Date	2021-10-14	**Personnel**	LC
Easting	900421.5213021053	**Northing**	6571645.335509442
Landform and soil		**Rock**	
Landform	Claypan	**Rock type/s**	Granite
Soil type	Clay	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Highly degraded		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Clearing,Erosion,Litter,Overgrazing,Vehicle	**Microhabitats**	Rock crevices,Woody debris
Introduced fauna	Cattle		

Vegetation			
Upper stratum	Mid (10-30 m)	Isolated trees (<0.25%)	*Eucalyptus sp.*
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Tussock grassland (50-80%)	*grass sp. and thistle sp. sedges boemia sp.*

Fulcrum photo ID	bfe042ed-7948-4c78-9fe1-7c8541220392,7696b9b4-9eeb-4df8-8e63-

HABC22

Project:	4815 Coolgardie Biological Spring Survey		
Date	2021-10-14	**Personnel**	LC
Easting	900235.352356134	**Northing**	6572033.776216977
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange,Red	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Clearing,Litter,Vehicle tracks,Weeds	**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Woodland (20-50%)	*Acacia sp.*
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	*dodenea sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*ptilotus sp. herbs*

Fulcrum photo ID	51a9f868-dbfc-4d0d-aa65-cebf271c9d24,bcb04dd4-53d3-407a-9ce9-

HABC23

Project:	4816 Coolgardie Biological Spring Survey		
Date	2021-10-14	**Personnel**	LC
Easting	900167.7359049395	**Northing**	6570928.550377593
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Grey,Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Highly degraded		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Clearing,Litter,Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*saltbush cena sp. herbs sp.*

Fulcrum photo ID	4e1b0f41-0592-423d-8408-a19672a9d5c6,f06cb18e-09e9-41d6-a61b-

HABC24

Project:	4817 Coolgardie Biological Spring Survey		
Date	2021-10-14	**Personnel**	LC
Easting	899663.2610756675	**Northing**	6571226.542719762
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Isolated trees (<0.25%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*eremophila sp. dodenea sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*ptilotus sp. salt bush sp.*

Fulcrum photo ID	8f123c2e-9663-4712-845a-fe15deec853c,26ed00e2-46e6-4415-ad80-

C2H2

Project:	4818 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	SW
Easting	897743.7674614477	**Northing**	6565685.35287808
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia and Melaleuca sp*
Ground stratum	Low (>0.5 m)	Isolated hummock grasses (<0.25%)	*Scaveloa spin*

Fulcrum photo ID	c4cad0bd-4f57-4209-9459-7401a6a867d2

C2H4

Project:	4819 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	SW
Easting	897738.8708299723	**Northing**	6565557.982810425
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	75 - 100%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Melaleuca sp*
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	*Scaveloa spin*

Fulcrum photo ID	a0f87fb2-1a73-43d5-bfb4-bf7e2ce804a4

C2H6

Project:	4820 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	SW
Easting	897718.2217606371	**Northing**	6565454.049011737
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	75 - 100%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance		**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Isolated trees (<0.25%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Eucalyptus sp*
Ground stratum	Low (>0.5 m)		

Fulcrum photo ID	a25ac42a-b0be-4c30-a8b2-8e07a2f5bcd9

C2H8

Project:	4821 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	SW
Easting	897820.0346483674	**Northing**	6565227.984386012
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Isolated trees (<0.25%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Eremophila sp*
Ground stratum			

Fulcrum photo ID	93421722-1ad4-4c10-9e11-de2ef1902d8b

C2H10

Project:	4822 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	SW
Easting	898008.8963851782	**Northing**	6565265.629842697
Landform and soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Calcrete,Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange,Red	**Surface stone size classes present**	25 - 50%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Unknown	**Water Source**	Absent
Disturbance	Erosion	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Eremophila*
Ground stratum			

Fulcrum photo ID	45de2c23-38f7-401c-8d48-42e59fe7b842

C2H12

Project:	4823 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	SW
Easting	898183.4047518701	**Northing**	6565240.394553069
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition			
Quality	Good	**Habitat Features**	
Fire History	Unknown	**Water Source**	Absent
Disturbance	Erosion	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Low (0.5-1 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*Senna art fil*
Ground stratum			

Fulcrum photo ID	08469bcc-a34b-4b23-bf34-76982cd97e9c

HABC2LC01

Project:	4824 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	LC
Easting	899664.2211246493	**Northing**	6565980.506265143
Landform and soil		**Rock**	
Landform	Gorge	**Rock type/s**	Granite,Quartz
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Yellow	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Highly degraded		
Fire History	Unknown	**Water Source**	Absent
Disturbance		**Microhabitats**	Exfoliating rock,Rock crevices
Introduced fauna	None observed		

Vegetation

Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*eremophila sp. salt bush sp.*

Fulcrum photo ID	4ebf3251-d69c-4d7e-93c5-260eba7ae549,d2ea3ab1-5502-453c-9997-

HABC2LC02

Project:	4825 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	LC
Easting	899850.8139667105	**Northing**	6565706.821050039
Landform and soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Granite,Quartz
Soil type	Sandy clay	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance		**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	Goat		

Vegetation

Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*eremophila sp.*

Fulcrum photo ID	4b2247e7-9fed-441d-b103-59e6bf65756c,a6bfbb91-71be-4e28-992d-

HABC2LC03

Project:	4826 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	LC
Easting	900665.7028282916	**Northing**	6565871.541426335
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Sandy clay	**Surface stone cover**	
Soil colour	Orange,Red	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Low (<10 m)	Open forest (50-80%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Mid (0.5-1 m)	Sparse forbland (0.25-20%)	*eremophila sp.*

Fulcrum photo ID	b0752528-0a49-4733-a884-d5b48bd2d627,ce6b6969-95db-4c53-bfdd-

HABC2LC04

Project:	4827 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	LC
Easting	900563.0312287982	**Northing**	6565632.278082406
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Granite,Quartz
Soil type	Clay	**Surface stone cover**	
Soil colour	Orange,Red	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Low (<10 m)	Woodland (20-50%)	*eremophila sp. Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*ptilotus sp.*

Fulcrum photo ID	2b2a12b3-b9f2-4fd2-9d5d-b72a773595d9,19860892-f6e1-4a85-843a-

HABC2LC05

Project:	4828 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	LC
Easting	900752.345712022	**Northing**	6565409.609161669
Landform and soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Granite,Quartz
Soil type	Clay	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Erosion,Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	Rabbit		

Vegetation			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*eremophila sp.*

Fulcrum photo ID	bc023295-6531-4172-95cc-e3d96c28e365,3b64dc10-30df-4627-8e7f-

HABC2LC06

Project:	4829 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	LC
Easting	900415.1933355466	**Northing**	6565440.556371264
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Clay	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Hollows - logs,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Open forest (50-80%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp., salt bush sp. (in photos)*
Ground stratum	Absent		

Fulcrum photo ID	30f77ad9-d6b9-45a3-885d-56cf525debd8,a70c538c-fc2a-4dbd-be76-

C2H14

Project:	4830 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	898138.1000480026	**Northing**	6564928.758600489
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Ironstone
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia sp*
Ground stratum	Absent		

Fulcrum photo ID	6eb608e3-e562-4314-b5d8-0ecf176e3906

C2H16

Project:	4831 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	898035.707931469	**Northing**	6564690.336170336
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Ironstone
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Eremophila*
Ground stratum	Absent		

Fulcrum photo ID	10efecf9-ff45-4474-8f07-5ef50a3af30e

C2H18

Project:	4832 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	897721.3419470013	**Northing**	6564081.199149741
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Calcrete,Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition			
Quality	Disturbed	**Habitat Features**	
Fire History	Unknown	**Water Source**	Absent
Disturbance		**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Eremophila*
Ground stratum	Absent		

Fulcrum photo ID	25ba9c30-9a14-438f-952a-4d1cff16da86

C2H20

Project:	4833 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	897584.545833359	**Northing**	6563668.195859093
Landform and soil		**Rock**	
Landform	Escarpment	**Rock type/s**	Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Eremophila*
Ground stratum			

Fulcrum photo ID	2cd10b5a-17ad-4733-9cfb-f59f28c2f915

C2H22

Project:	4834 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	897407.7797388354	**Northing**	6563338.106537405
Landform and soil		**Rock**	
Landform	Lower slope	**Rock type/s**	Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance		**Microhabitats**	Hollows - trees,Leaf litter,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia sp*
Ground stratum	Absent		

Fulcrum photo ID	41f4047f-24e6-432f-a252-5b9c5469bfc3

C2H24

Project:	4835 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	897534.3882230611	**Northing**	6563041.229803004
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Calcrete,Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Atriplex sp*
Ground stratum	Absent		

Fulcrum photo ID	271b8409-d185-4552-a223-f5daf7b9d31a

C2H26

Project:	4836 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	898122.0154905103	**Northing**	6562781.590976534
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*Senna sp*
Ground stratum			

Fulcrum photo ID	1f602d5d-5404-457f-b29f-7f84c7aaf087

C2H28

Project:	4837 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	898839.090998794	**Northing**	6563393.36065102
Landform and soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Eremophila*
Ground stratum	Absent		

Fulcrum photo ID	c4b932de-0fdf-423c-ad63-8302ddd73365

C2H30

Project:	4838 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	898737.6863762725	**Northing**	6563394.817201562
Landform and soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Erosion	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia*
Ground stratum	Absent		

Fulcrum photo ID	d16a4f03-6dd4-407a-9184-f1b3cd802bc0

HABC2LC07

Project:	4839 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	LC
Easting	900704.6350980257	**Northing**	6565575.750708525
Landform and soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Granite,Quartz
Soil type	Clay	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Erosion	**Microhabitats**	Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*eremophila sp.*

Fulcrum photo ID	51affc75-b427-4809-8ef2-d024d562bb5f,266b71e9-b0ea-422e-8f3d-

HABC2LC08

Project:	4840 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	LC
Easting	900776.5532258475	**Northing**	6565713.262605984
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Granite
Soil type	Clay	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*ptilotus sp.*

Fulcrum photo ID	21c66f48-529d-461a-b6c1-d0ce4033c0f2,193ee8c1-7c0d-4271-ac0a-

HABC2LC09

Project:	4841 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	LC
Easting	900164.9336511727	**Northing**	6565653.958929246
Landform and soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Granite,Quartz
Soil type	Sand	**Surface stone cover**	
Soil colour	Orange,White	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Erosion	**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*eremophila sp.*
Ground stratum	Mid (0.5-1 m)	Forbland (50-80%)	*eremophila sp.*

Fulcrum photo ID	0fca10bc-0b3f-4884-a596-1bdc49f0718d,8c8bcab2-c4f1-453a-9933-

HABC2LC10

Project:	4842 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	LC
Easting	900449.314056684	**Northing**	6564956.76156202
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Clay	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Clearing,Erosion,Litter	**Microhabitats**	Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*eremophila sp.*
Ground stratum	Mid (0.5-1 m)	Forbland (50-80%)	*eremophila sp.*

Fulcrum photo ID	490f139c-c787-45ce-8b70-4790296ee53c,e21395e7-7464-42cf-bbb9-

HABC2LC11

Project:	4843 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	LC
Easting	901276.6564614684	**Northing**	6565677.347229139
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Clay	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Forbland (50-80%)	*eremophila sp.*

Fulcrum photo ID	bbb0226c-b301-4a5f-ae00-44c3dc787f94,d6688097-4e41-4751-a79f-

HABC2LC12

Project:	4844 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	LC
Easting	900519.9630059553	**Northing**	6566882.003260277
Landform and soil		**Rock**	
Landform	Claypan	**Rock type/s**	None
Soil type	Clay	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Unknown	**Water Source**	Present
Disturbance	Vehicle tracks,Weeds	**Microhabitats**	
Introduced fauna	None observed		

Vegetation

Upper stratum	Absent		
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Grassland (50-80%)	*various weeds*

Fulcrum photo ID	5e418349-31da-4044-8d04-a4990c1f72b0,450a84a8-a05b-4ee2-a0d1-

HABC2LC13

Project:	4845 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	LC
Easting	900731.210354395	**Northing**	6567309.737509467
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	High quality		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Low (<10 m)	Woodland (20-50%)	*eucalyptus sp.*
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*eremophila sp.*
Ground stratum	Mid (0.5-1 m)	Open forbland (20-50%)	*eremophila sp. amd other mixed herbs*

Fulcrum photo ID	570709d4-00c6-43d2-9de6-ef44159e1c8e,2c8bbe5f-630c-45f1-87bb-

HABC2LC14

Project:	4846 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	LC
Easting	900023.0356903123	**Northing**	6566601.201476825
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Clearing,Vehicle tracks,Weeds	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Rock crevices,Woody debris
Introduced fauna	Goat,Rabbit		

Vegetation			
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	*eucalyptus sp.*
Mid stratum	Tall (>2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*acacia sp.*
Ground stratum	Low (>0.5 m)	Forbland (50-80%)	*eremophila sp.*

Fulcrum photo ID	2cc3ef18-e4b7-46ee-9c1d-0f4614438dc9,6c342fc0-f7f5-443d-9f15-

HABC2LC15

Project:	4847 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	LC
Easting	900431.2214361653	**Northing**	6572530.387661901
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*dodenea sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*ptilotus sp.*

Fulcrum photo ID	4199f50b-b3c4-4fd5-9f8a-3a7d7df69999,761b02e4-9a61-427a-b17e-

HABC2LC16

Project:	4848 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	LC
Easting	900465.6771902259	**Northing**	6573277.0945564695
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Calcrete,Granite
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown	**Surface stone size classes present**	0 - 5%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	Cattle		

Vegetation			
Upper stratum	Low (<10 m)	Open forest (50-80%)	*eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Mid (0.5-1 m)	Sparse forbland (0.25-20%)	*eremophila sp. mixed herbs*

Fulcrum photo ID	c208e2cf-2947-4ff4-b0f0-2556bb277948,c4d25400-28ff-4427-be00-

HABC2LC17

Project:	4849 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	LC
Easting	897973.2561752913	**Northing**	6573513.342421641
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	5 - 25%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Open forest (50-80%)	*eucalyptus sp., acacia sp.*
Mid stratum	Low (0.5-1 m)	Shrubland and/or heathland (50-80%)	*dodenea sp, eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*ptilotus sp., eremophila sp.*

Fulcrum photo ID	372d8949-1d3b-4870-87bd-7951b013d9e4,6cf82aac-74d5-4f6d-afb6-

HABC2LC18

Project:	4850 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	LC
Easting	897208.723548352	**Northing**	6573995.251239745
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*eucalyptus sp.*
Mid stratum	Tall (>2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*eremophila sp.*
Ground stratum	Tall (1-2 m)	Forbland (50-80%)	*eremophila sp.*

Fulcrum photo ID	7081e49e-b513-4cfc-a25e-8219bc15b8f3,4be2e29b-ea2a-4adf-9a60-

HABC2LC19

Project:	4851 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	LC
Easting	897024.5424583412	**Northing**	6573400.948208064
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Calcrete,Ironstone,Laterite
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	75 - 100%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*eucalyptus sp.*
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*herb in photos*

Fulcrum photo ID	4635704e-82e0-486f-bffd-6cb63a245066,db940a29-9610-40ed-a43e-

HABC2LC20

Project:	4852 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	LC
Easting	897207.7894486763	**Northing**	6573276.328611162
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eucalyptus sp.*
Ground stratum	Mid (0.5-1 m)	Forbland (50-80%)	*eremophila sp. eremophila sp.*

Fulcrum photo ID	b50692de-a768-4d17-bf33-bb534451e50e,1a36084b-a01d-479b-8a3d-

C2H32

Project:	4853 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	SW
Easting	898647.6288961614	**Northing**	6563412.670039611
Landform and soil		**Rock**	
Landform	Escarpment	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia sp*
Ground stratum	Absent		

Fulcrum photo ID	6fed3548-6854-44ad-ace1-79cee900d9bb

C2H34

Project:	4854 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	SW
Easting	898574.3445931688	**Northing**	6563567.903756286
Landform and soil		**Rock**	
Landform	Lower slope	**Rock type/s**	Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance		**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia*
Ground stratum	Absent		

Fulcrum photo ID	5cebab13-aadb-470a-b104-5994b272e88d

C2H36

Project:	4855 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	SW
Easting	898440.2002370819	**Northing**	6572518.477781318
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Granite,Laterite
Soil type	Loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Eremophila*
Ground stratum	Absent		

Fulcrum photo ID	3ee1eb2e-e0e3-4e77-9780-bb40cd650728

C2H38

Project:	4856 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	SW
Easting	898296.4071683842	**Northing**	6572123.600769359
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Granite,Laterite,Quartz
Soil type	Loam	**Surface stone cover**	
Soil colour	Orange,Red	**Surface stone size classes present**	50 - 75%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Unknown	**Water Source**	Absent
Disturbance		**Microhabitats**	Hollows - logs,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia*
Ground stratum	Absent		

Fulcrum photo ID	b933e67c-48b0-421d-8100-6518118a4171

C2H40

Project:	4857 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	SW
Easting	897937.4325779848	**Northing**	6572315.898469241
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Laterite,Quartz
Soil type	Loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	50 - 75%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Hollows - logs,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia*
Ground stratum	Absent		

Fulcrum photo ID	219563fd-c9bd-4cd0-8160-634649c52222

C2H42

Project:	4858 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	SW
Easting	897160.8402197923	**Northing**	6571960.858564717
Landform and soil		**Rock**	
Landform	Lower slope	**Rock type/s**	Ironstone,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	75 - 100%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Eremophila*
Ground stratum	Absent		

Fulcrum photo ID	e4db22e5-83d5-4438-9c84-680175928daf

C2H46

Project:	4859 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	SW
Easting	897842.0485219336	**Northing**	6571592.065394482
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Ironstone,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Eremophila and Atriplex*
Ground stratum	Absent		

Fulcrum photo ID	d8c7d48f-634c-4c46-a402-4949c69c1196

C2H48

Project:	4860 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	SW
Easting	897986.3585784157	**Northing**	6572856.793533593
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Granite,Ironstone,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Unknown	**Water Source**	Absent
Disturbance		**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna			

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia, eremophila, senna*
Ground stratum	Absent		

Fulcrum photo ID	77fa71fc-2061-4776-b46f-5533c5547e69

C2H50

Project:	4861 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	SW
Easting	899410.3384907652	**Northing**	6573733.02122001
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Woody debris
Introduced fauna	Rabbit		

Vegetation			
Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Allocasuarina, Acacia*
Ground stratum	Absent		

Fulcrum photo ID	fc56790e-0b7a-4af8-83ad-43361892dc2a

C2H52

Project:	4862 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	SW
Easting	899024.133330778	**Northing**	6573326.9469294455
Landform and soil		**Rock**	
Landform	Claypan	**Rock type/s**	Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Woody debris
Introduced fauna	Cattle,Rabbit		

Vegetation

Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Eremophila*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*Weed*

Fulcrum photo ID	3932baf5-4aea-4948-89e6-ec5c8ba929e9

C2H54

Project:	4863 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	SW
Easting	898558.6120445768	**Northing**	6577434.127282435
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Ironstone,Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Eremophila*
Ground stratum	Absent		

Fulcrum photo ID	90af6e6b-2828-4926-bd8c-7ce23e0bbedf

C3H2

Project:	4864 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	SW
Easting	901330.4863598039	**Northing**	6566876.698387651
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Granite,Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	*Senna sp*
Ground stratum	Absent		

Fulcrum photo ID	9639322a-c25b-452c-9395-2d845a0db67d

C3H6

Project:	4865 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	SW
Easting	901099.8592427254	**Northing**	6567133.638773368
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Granite,Laterite,Quartz
Soil type	Clay	**Surface stone cover**	
Soil colour	Brown	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	Cattle		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Eremophila*
Ground stratum	Absent		

Fulcrum photo ID	8c9b4a09-e53a-4d9d-8d80-11e634b91457

HABC2LC21

Project:	4866 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	LC
Easting	897544.5825756477	**Northing**	6572777.829306185
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Ironstone,Quartz
Soil type	Clay	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*eremophila sp*

Fulcrum photo ID	0f0d98ec-ac0a-44f0-8ad5-c4fc373482ad,537a883e-d403-430b-8f06-

HABC2LC22

Project:	4867 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	LC
Easting	897656.784997021	**Northing**	6572883.799383562
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Highly degraded		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Clearing,Erosion,Vehicle tracks	**Microhabitats**	Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*eucalyptus sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*eremophila sp.*

Fulcrum photo ID	0cc91ff4-82c9-4e1a-8a1d-4d2ee6573b54,5ea1acb4-732a-4029-ace5-

HABC2LC23

Project:	4868 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	LC
Easting	897726.5517688439	**Northing**	6573587.154734112
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	*eremophila sp.*

Fulcrum photo ID	af1106ec-72c2-4078-a6cf-65fdc8ed54e0,772849ce-8e9f-4ea7-8aff-

HABC2LC24

Project:	4869 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	LC
Easting	897731.7215430276	**Northing**	6578600.152287805
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Calcrete,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*eremophila sp.*

Fulcrum photo ID	7264e4af-f5e3-4399-a7c3-718a30cf91f9,043ac726-f8bb-4b81-9e64-

HABC3LC01

Project:	4870 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	LC
Easting	901535.8496579034	**Northing**	6568495.428023138
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Ironstone,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Very good	**Water Source**	Absent
Fire History	Unknown	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Disturbance	Vehicle tracks,Weeds		
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)	*eremophila sp.*
Ground stratum	Mid (0.5-1 m)	Forbland (50-80%)	*eremophila sp.*

Fulcrum photo ID	8e57e003-8ef0-4049-8a3d-f7be3316a26a,985a366e-c098-4cbd-9c83-

HABC3LC02

Project:	4871 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	LC
Easting	901385.6159884571	**Northing**	6567944.72848946
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Calcrete,Granite,Ironstone
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Good	**Water Source**	Absent
Fire History	Unknown	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Disturbance	Litter,Vehicle tracks		
Introduced fauna	Cattle		

Vegetation			
Upper stratum	Low (<10 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp., sandlewood*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*eremophila sp. and mixed herbs*

Fulcrum photo ID	0456611e-322d-43f0-961a-92e3214f4ff6,b383b714-6500-46fb-b290-

HABC3LC03

Project:	4872 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	LC
Easting	901116.1473216031	**Northing**	6567716.167221133
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Calcrete,Granite
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Orange,Red	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*dodenea sp, mixed shrubs*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*mixed herbs*

Fulcrum photo ID	a233588d-1aef-4741-8ae9-5b0d1c66fa0a,42b4783a-a56b-40d7-8240-

HABC3LC04

Project:	4873 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	LC
Easting	900730.2686670613	**Northing**	6567991.079386459
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Calcrete,Granite
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*eremophila sp.*
Ground stratum	Mid (0.5-1 m)	Sparse forbland (0.25-20%)	*eremophila sp., mixed herbs*

Fulcrum photo ID	20c229a2-37df-4ff5-9e14-6fa99181557f,a6d138ee-2032-4f92-93bc-

Appendix G
Fauna Inventory

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			State	[illegible]ederal	Sighting	Call	Remains	Scat	Tracks	Burrow	Digging
Aves											
Acanthizidae	*Smicrornis brevirostris*	Weebill				2					
	Acanthiza inornata	Western Thornbill				2					
	Aphelocephala leucopsis	Southern Whiteface				1					
	Calamanthus cautus	Shy Groundwren (Shy Heathwren)				1					
	Acanthiza uropygialis	Chestnut-rumped Thornbill			2	1					
	Sericornis frontalis					1					
Artamidae	*Artamus personatus*	Masked Woodswallow			2						
Cacatuidae	*Cacatua roseicapilla*	Galah				1					
	Cacatua leadbeateri	Major Mitchell's Cockatoo				1					
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike		MA	2			1			
	Coracina maxima	Ground Cuckoo-shrike				1					
	Lalage tricolor	White-winged Triller				1					
Climacteridae	*Climacteris rufus*	Rufous Treecreeper				1					
Columbidae	*Phaps chalcoptera*	Common Bronzewing			1						
	Ocyphaps lophotes	Crested Pigeon			3						
Corvidae	*Corvus bennetti*	Little Crow				5					
	Corvus orru cecilae	Western Crow				1					
	Corvus coronoides	Australian Raven			2						
Cracticidae	*Strepera versicolor*	Grey Currawong			4	2					
Dromaiidae	*Dromaius novaehollandiae*	Emu						1	2		
Estrildidae	*Taeniopygia guttata*	Zebra Finch				2					
Falconidae	*Falco cenchroides*	Australian Kestrel (Nankeen Kestrel)		MA	3						
Maluridae	*Malurus splendens*	Splendid Fairywren				1					
Meliphagidae	*Anthochaera carunculata*	Red Wattlebird			1	3					
	Lichmera indistincta	Brown Honeyeater				1					
	Gavicalis virescens	Singing Honeyeater			13	2					

Family	Scientific Name	Common Name	Conservation Status		Method						
			State	Federal	Sighting	Call	Remains	Scat	Tracks	Burrow	Digging
	Manorina flavigula	Yellow-throated Miner				4					
	Acanthagenys rufogularis	Spiny-cheeked Honeyeater			7						
	Melithreptus brevirostris	Brown-headed Honeyeater				1					
	Gliciphila melanops	Tawny-crowned Honeyeater			2	1					
Meropidae	*Merops ornatus*	Rainbow Bee-eater		MA	1						
Monarchidae	*Grallina cyanoleuca*	Magpie-lark		MA	2						
Motacillidae	*Anthus australis*	Australian Pipit			4						
Oreoicidae	*Oreoica gutturalis*	Crested Bellbird			1	11					
Otididae	*Ardeotis australis*	Australian Bustard							1		
Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler			5	8					
	Pachycephala occidentalis	Western Golden Whistler (Western Whistler)			6						
Petroicidae	*Microeca fascinans*	Jacky Winter			1	1					
Psittacidae	*Melopsittacus undulatus*	Budgerigar			23						
	Platycercus zonarius	Australian Ringneck			17	2					
Psophodidae	*Cinclosoma clarum*	Western Chestnut Quail-thrush (Copperback Quail-thrush)			2						
Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail			2						
Mammalia											
Bovidae	**Capra hircus*	Goat						8	1		
	**Bos taurus*	European Cattle						9	7		
Canidae	**Canis familiaris familiaris*	Dog						2			
	**Vulpes vulpes*	Red Fox						1			
Dasyuridae	*Dasyurus geoffroii fortis*	Western Quoll, Chuditch	VU	VU				1			
Equidae	**Equus caballus*	Horse						1			
Felidae	**Felis catus*	Cat					1				
Leporidae	**Oryctolagus cuniculus*	Rabbit			1		3	18		1	2
Macropodidae	*Macropus fuliginosus melanops*	Western Grey Kangaroo			1			39	2		
	Osphranter rufus	Red Kangaroo, Marlu			2						
Reptilia											
Agamidae	*Ctenophorus maculatus*				2						

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			State	□ederal	Sighting	Call	Remains	Scat	Tracks	Burrow	Digging
	Ctenophorus cristatus	Bicycle Dragon			6						
	Tympanocryptis pseudopsephos	Goldfields pebble-mimic dragons			2						
	Ctenophorus ornatus	Ornate Crevice Dragon			1						
Diplodactylidae	*Crenadactylus ocellatus*	South-western Clawless Gecko			3						
Gekkonidae	*Heteronotia binoei*	Bynoe's Gecko			8						
	Gehyra variegata	Variegated gehyra			2						
Scincidae	*Tiliqua rugosa*	Bobtail			8		2				
Varanidae	*Varanus gouldii*	Bungarra or Sand Goanna			1						

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Coolgardie Project

Coolgardie *Camponotus* sp. nr. *terebrans* Targeted Survey

Prepared for

Focus Minerals Limited

May 2022

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Document Reference	Revision	Prepared by	Reviewed by	Admin Review	Submitted to Client	
					Copies	Date
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5023AA_Rev1	Client Draft	360 Environmental	Focus Minerals	-	1x electronic	07/04/2022
5023AA_Rev2	Client Final	M. Lohr	S. Walker	LI	1x electronic	03/05/2022

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Executive Summary

Focus Minerals Limited commissioned 360 Environmental Pty Ltd part of SLR Consulting to undertake a targeted survey for the ant *Camponotus* sp. nr. *terebrans* – an ant species associated with the Arid Bronze Azure Butterfly (*Ogyris subterrestris petrina*, CR, DBCA EPBC) within the Three Mile Mine Project, Coolgardie. The Survey Area consists of several discrete parcels of land adjacent to the townsite of Coolgardie, Western Australia and covers approximately 1,786 ha.

The purpose of the assessment was to determine whether colonies of the ant *Camponotus* sp. nr. *terebrans* were present within the Survey Area in large enough numbers to support the Arid Bronze Azure Butterfly (ABAB). The survey was conducted to inform decisions regarding the specific lease areas for proposed construction sites within the Survey Area. This report presents the background, methods, results, and discussion of the survey undertaken.

Potential ABAB habitat containing smooth-barked eucalypt species within the Survey Area was delimited prior to the survey based on aerial imagery and previous 360 Environmental biological surveys to the Survey Area. Within the 1,055 ha of potential ABAB habitat, 326 suitable trees were searched in accordance with DBCA protocols. Searching was also conducted during transects between the trees identified at each tree survey point.

No colonies of *Camponotus* sp. nr. *terebrans* were detected within the Survey Area. A single colony of ants in the genus *Camponotus* was observed, however, the ants were identified as *Camponotus nigriceps*. This species is not associated with the ABAB. The Survey Area falls within the known range of the ABAB, and smooth-barked eucalypts used by their host ant are widespread within the Survey Area. However, habitat quality within the Survey Area was generally poor due to scarcity of loose sandy soils where *C.* sp. nr. *terebrans* typically occurs. Substantial levels of disturbance from historic mining activities within the Survey Area may facilitate the high abundance of the meat ant *Iridomyrmex purpureus* observed during the survey. *Iridomyrmex purpureus* is considered a competitor of the ABAB. The high abundance of this species, in conjunction with suboptimal substrates, probably explains the lack of detection of *C.* sp. nr. *terebrans* within the Survey Area.

Another conservation significant butterfly, the Inland Hairstreak (*Jalmenus aridus*, P1, DBCA), was opportunistically observed during the survey at three locations in the southwest of the Survey Area. Three adults were collected for identification and the specimens have been vouchered at the Western Australia Museum. A total of 16 adult Inland Hairstreaks were observed, including the three collected specimens. This species was previously only known from one location; however, three additional populations of the species have recently been found north of Kalgoorlie. Host plants used by *J. aridus* and similar habitats to the sites where *J. aridus* was observed within the Survey Area appear to be present in the nearby Kangaroo Hills Timber Reserve and are common in the wider region. This suggests that additional populations might be detected in similar habitats in adjacent areas outside the Survey Area under appropriate environmental conditions.

Abbreviations

Abbreviations used through the report are described below in

Table 1: Abbreviations

Abbreviations	Description
ABAB	Arid Bronze Azure Butterfly (*Ogyris subterrestris petrina*)
BAM Act	Biosecurity and Agriculture Management Act 2007
BC Act	Biodiversity Conservation Act 2016
BoM	Bureau of Meteorology
CD	Conservation Dependent Fauna
CR	Critically Endangered
DAWE	Department of Agriculture, Water, and the Environment
DBCA	Department of Biodiversity, Conservation and Attractions
DoE	Department of Environment
DP	Declared Pest
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EN	Endangered
EP Act	Environmental Protection Act 1986
EPA	Environmental Protection Authority
EPBC Act	Environment Protection Biodiversity and Conservation Act 1999
ESA	Environmentally Sensitive Area
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
MI	Migratory
MNES	Matters of National Environmental Significance
NVIS	National Vegetation Information System
OS	Other Specially Protected Fauna
P	Priority
PEC	Priority Ecological Community

Abbreviations	Description
PMST	Protected Matters Search Tool
T	Threatened
TEC	Threatened Ecological Community
TPFL	Threatened and Priority Flora Database
VU	Vulnerable
WAH	Western Australian Herbarium
WAM	Western Australian Museum
WoNS	Weeds of National Significance

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1 Introduction

1.1 The Project

Focus Mineral Limited (FML) commissioned 360 Environmental Pty Ltd (360 Environmental) part of SLR Consulting (SLR) to undertake a fauna survey targeting the host ant (*Camponotus* sp. nr. *terebrans*) of the critically endangered Arid Bronze Azure Butterfly (*Ogyris subterrestris petrina*) (ABAB) to support the environmental and planning approvals for proposed expansions to the FML mining operation in Coolgardie Western Australia (the Project).

The Project consists of pre-defined Survey Areas surrounding the townsite of Coolgardie, Western Australia (Figure 1) and covers approximately 1786 hectares (ha) in the Coolgardie bioregion of Western Australia.

1.2 Objectives and Scope

In order to meet the objectives of this assessment, the following scope of works was undertaken:

- Conduct a targeted survey for the ant species *Camponotus* sp. nr. *terebrans* in all areas of suitable habitat in the Survey Area, applying the formula for number and spacing of sample trees given by Department of Biodiversity, Conservation and Attractions (2020a) based on area of suitable habitat
- Produce a succinct report and maps to identify presence/absence of *Camponotus* sp. nr. *terebrans* at all tree survey points, and extent of any large colonies of the ant
- Opportunistically scan suitable habitat for *Jalmenus aridus*
- Produce a final report detailing presence/absence of *Camponotus* sp. nr. *terebrans* and report on any *Jalmenus aridus* sightings.

2 Background

2.1 Protection of Fauna

Western Australian fauna is formally protected by the following legislative measures:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environmental Protection Act 1986* (WA) (EP Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act).

In addition to these legislative measures, the WA Department of Biodiversity, Conservation and Attractions (DBCA) priority fauna list provides a non-legislative list of possibly threatened, rare but not threatened or near threatened taxa.

In addition to these protection mechanisms, the EIA process is supported by various guidance documents published by the Environmental Protection Authority (EPA), DBCA and the Department of Agriculture Water and Environment (DAWE).

Western Australia

- *Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (Environmental Protection Authority, 2020)
- *Guideline for the survey of arid bronze azure butterfly (ABAB) in Western Australia* (Department of Biodiversity Conservation and Attractions, 2020c)
- *Arid bronze azure butterfly (ABAB) survey in Western Australia additional information* (Department of Biodiversity Conservation and Attractions, 2020b).

Commonwealth

- *Matters of National Environmental Significance – Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (Department of the Environment, 2013)
- *Matters of National Environmental Significance – Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (Department of the Environment, 2013)
- *Conservation Advice: Ogyris subterrestris petrina Arid bronze azure (a butterfly)* (Threatened Species Scientific Comitte, 2014).

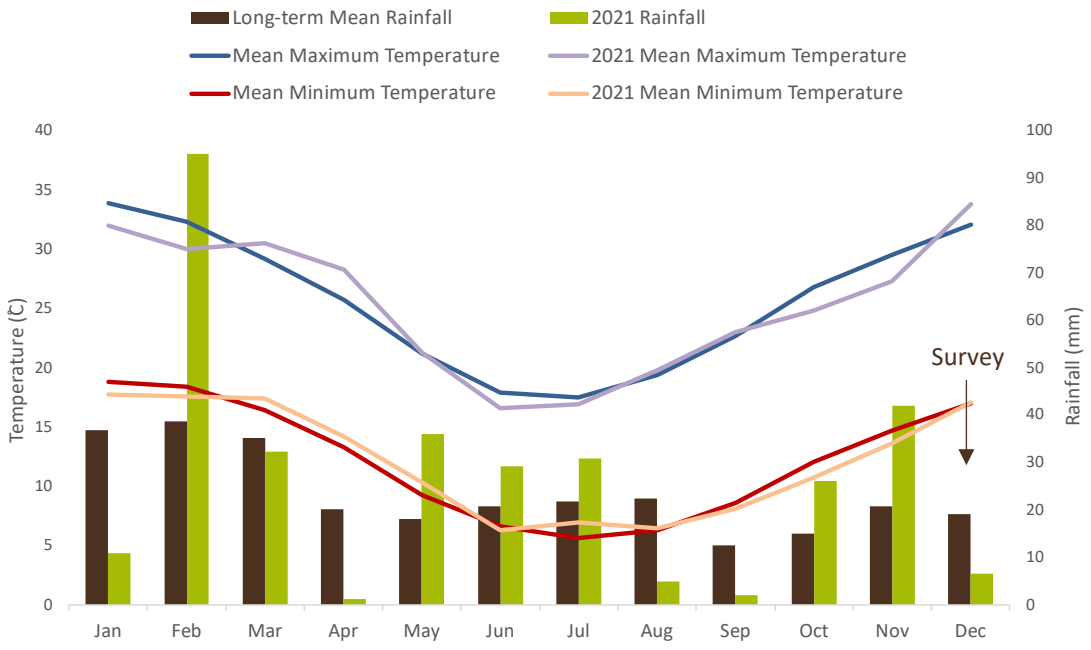
2.2 Existing Environment

2.2.1 Climate

The closest long-term Bureau of Meteorology weather station to the Survey Area with a complete temperature and rainfall dataset is Kalgoorlie-Boulder airport (Station 012038), located approximately 28 km Northeast of the Survey Area. Climate statistics were calculated utilising data from the most current climate normal, which is defined as a 30 year interval (Bureau of Meteorology, 2022), where possible. A climate normal is a period long enough to include year-to-year variations while avoiding the influence of longer-term changes in climate (Bureau of Meteorology, 2022).

The long-term mean minimum temperature for Kalgoorlie-Boulder Airport ranges from 5.6˚C (July) to 18.8˚C (January) (1991 to 2020) and the long-term mean maximum temperature ranges from 17.5 (July) to 33.9˚C (January; **Graph 1**).

The Kalgoorlie-Boulder Airport weather station recorded 316.6 mm of rainfall in 2021, which is 35.4 mm above the long-term average of 281.2 mm (1991 to 2020; **Graph 1**). In the three months prior to the survey (September 2021 to November 2021), 70 mm of rainfall was recorded, which is 21.8 mm above the long-term average of 48.2 mm (**Graph 1**).



Graph 1: Long term (1991-2020) and 2021 total rainfall, maximum and minimum temperatures for Kalgoorlie-Boulder Airport weather station (Station 012038) (Bureau of Meteorology, 2021)**.**

2.2.2 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs) or significant wetlands.

The Survey Area does not occur within a mapped ESA. The nearest ESA is the Rowles Lagoon Conservation Park located approximately 52 km north-west of the Survey Area (Figure 1) (Department of Water and Environmental Regulation, 2020).

2.2.3 Conservation Areas

The Survey Area is not located within any listed conservation area (Figure 1) (Department of Biodiversity Conservation and Attractions, 2021). The nearest conservation area is the Kangaroo Hills Timber Reserve which is situated adjacent to the southwestern section of the Survey Area separated by Nepean Road.

3 Methods

3.1 Field Survey

3.1.1 Field Personnel

The survey was conducted by Dr Rod Eastwood and Dr Michael Lohr, where Michael has over eight years of experience conducting fauna surveys and wildlife research in WA with substantial experience in the Goldfields Region, including surveys for short range endemic invertebrates. Dr Eastwood is a Research Associate at the WA Museum who has extensive field and research experience with the ABAB and related butterflies with symbiotic relationships with ants (e.g. Eastwood et al. 2006; Eastwood & Fraser 1999). He has conducted surveys for the targeted ant species (*Camponotus* sp. nr. *terebrans*) at Barbalin NR and multiple other sites. During surveys in 2020 and 2021 he identified four additional colonies of the host ant. His previous surveys have significantly increased the known area of occupation of the targeted species.

3.1.2 Licence and Authorisation

Where applicable, specimens were collected under Fauna taking license FO25000042 issued to Dr Eastwood, Authorization to Take or Disturb Threatened Species (Fauna) license number TFA 2021-0077 issued to A. A. Williams (Dr Eastwood authorised), and Flora taking license FB62000354 issued to Dr Michael Lohr.

3.1.3 Targeted Survey for *Camponotus* sp. nr. t*erebrans* and Arid Bronze Azure Butterflies

Field methods followed those described in the DBCA survey guidelines (Department of Biodiversity Conservation and Attractions, 2020b, 2020c). Potential ABAB habitat containing smooth-barked eucalypt species within the Survey Area was delimited prior to the survey using aerial imagery and observations during a previous visit to one portion of the Survey Area. A total of 1,055 ha of potentially suitable ABAB habitat was identified within the Survey Area (Figure 2).

The number and spacing of tree locations in potentially suitable ABAB habitat to be searched for *Camponotus* ant nests was determined using the following formula (Department of Biodiversity Conservation and Attractions, 2020c):

- No. sample trees: $10 \times \sqrt{(site\ area\ in\ ha)}$ = 325 trees
- Spacing: $\sqrt{\frac{(site\ area\ in\ ha \times 10{,}000}{(No.sample\ trees)}}$ = 150 metres

Minor modifications to the grid of tree survey points were made and one additional point was added for a total of 326 tree survey points to ensure that all potentially suitable habitat was adequately covered.

Tree survey points were searched during walked transects. Multiple trees (up to ten or more) were inspected during the walk between tree survey points and in the immediate vicinity. A point was scored 'absent', and the GPS location recorded, if no *Camponotus* ant nests were

identified. A tree survey was scored 'present', and the following data collected if *Camponotus* ant nests were found at any tree in the vicinity of the tree survey point:

- GPS location
- Tree species
- Diameter at breast height (DBH)
- Soil type
- If inquiline[1] *Pogonoscopus* sp. were observed in the ant nest
- The numbers of any additional nests in the vicinity of the tree survey point
- Photographs of the tree, nest, and ants.

Reproductive structures from the host tree were also collected, where possible, for positive identification if nests were located.

GPS-enabled tablets loaded with base data including aerial imagery, Survey Area boundary, and the grid of preselected sites were used for navigation and data collection in the field. Garmin GPS units were used to record transect routes and distances travelled.

3.1.4 Opportunistic searches for *Jalmenus aridus*

While conducting targeted searches for *Camponotus* sp. nr. *terebrans* at the Three Mile Project site, habitat identified as suitable for *Jalmenus aridus* (P1, DBCA) was opportunistically inspected by Dr Eastwood, as three new populations of the species have recently been found north of Kalgoorlie.

3.1.5 Specimen Collection and Identification

Butterfly specimens were collected with a hand net and euthanized with ethyl acetate before placing in a glassine envelope and storing at 3ºC until returning to Perth. Specimens were then prepared in accordance with WAM standard protocols, fully labelled, databased and deposited in the WAM Entomological collection.

Adult butterflies were tentatively identified in the field and confirmed with reference to Braby (2004) and to known *J. aridus* specimens in Dr Eastwood's collection at the Museum of Comparative Zoology, Harvard University (https://mczbase.mcz.harvard.edu/).

Ant specimens were preserved in 100% ethanol and taken to confirmed by Dr Brian Heterick at the Western Australia Museum for confirmation of identifications made in the field.

Tree and shrub species were identified by the WA Herbarium based on specimens collected in the field.

[1] An animal that exploits the living space of another

3.1.6 Weather Conditions

Weather conditions for the survey are presented in Table 2. Temperature and rainfall data is from Kalgoorlie-Boulder Airport weather station (Station 012038) (Bureau of Meteorology, 2021). Minimum temperatures during the survey were above the long-term average minimum temperature for December (12.2˚C), and maximum temperatures during the survey were similar to the long-term average maximum temperature for December (25.7˚C). A total of 6.4 mm of rainfall was recorded during December 2021, which is lower than the long-term median of 16.2mm.

Table 2: Targeted *Camponotus* sp. nr. *terebrans* Survey weather conditions

Date	Temperature (˚C)		Rainfall (mm)	Max wind speed km/h
	Min	Max		
13/12/2021	12.0	29.8	0	41
14/12/2021	17.6	36.9	0	50
15/12/2021	15.1	34.4	0	57
16/12/2021	21.8	41.1	0	61

3.2 Limitations

Limitations and constraints of the targeted survey are detailed in Table 3.

Table 3: Limitations and constraints associated with the survey

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
Survey Scope	Not a constraint	A targeted survey for the ant *Camponotus* sp. nr. *terebrans* was undertaken in accordance with DBCA Guidance (Department of Biodiversity Conservation and Attractions, 2020b, 2020c) and was considered appropriate to support approvals applications.
Availability of Data	Not a constraint	All data required to complete the scope of works including regional and local contextual information was available.
Site Access	Not a constraint	The Survey Area was able to be accessed by vehicle and on foot.
Survey Intensity and Resources	Not a constraint	Survey intensity (number and spacing of trees) was determined by the formulae provided in DBCA guidance. The number of trees surveyed was consistent with the recommendations generated by the formulae for the area of potential habitat present in the survey area.
Experience	Not a constraint	The survey was conducted by Dr Rod Eastwood and Dr Michael Lohr. Dr Lohr has over eight years of experience conducting fauna surveys and wildlife research in WA including substantial experience in the Goldfields Region, including surveys for SRE invertebrates. Dr Eastwood is a Research Associate at the WA Museum who has extensive field and research experience with the

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
		ABAB and related butterflies with symbiotic relationships with ants (e.g. Eastwood et al. 2006; Eastwood & Fraser 1999). He has conducted surveys for the targeted ant species (*Camponotus* sp. nr. *terebrans*) at Barbalin NR and multiple other sites. During surveys in 2020 and 2021 he identified four additional colonies of the host ant. His previous surveys have significantly increased the known area of occupation of the targeted species.
Timing, weather, season	Not a constraint	Surveys for *Camponotus* sp. nr. *terebrans* may be conducted at any time of the year or time of day and are not substantially impacted by weather.
Life Forms Sampled	Not a constraint	The survey targeted one species of ant and was consistent with DBCA guidelines for this species. An additional priority species was opportunistically observed and collected during the survey. All taxa recorded were able to be identified with a high level of scientific confidence to species level.
Mapping Reliability	Not a constraint	Potential *Camponotus* sp. nr. *terebrans* habitat mapping prior to the survey was based largely on aerial imagery of the Survey Area and a previous visit to one portion of the Survey Area. Areas where uncertainty about habitat type was an issue were included as potential habitat to ensure that no areas of potential habitat went unsurveyed.
Disturbances (fire, flood etc.)	Not a constraint	No disturbances occurred during any of the surveys. Areas of disturbance associated with clearing, historic mining, and rubbish were not an impediment to the survey.
Completeness	Not a constraint	The survey was considered complete for a targeted ABAB survey. Staff appropriately surveyed the number of trees required by DBCA guidelines.

4 Results

4.1 *Camponotus* sp. nr. *terebrans* and Arid Bronze Azure Butterflies

Despite the presence of suitable smooth-barked eucalypt trees and areas of floristic diversity, no *C.* sp. nr. *terebrans* (ABAB ants) or Arid Bronze Azure Butterfly (*Ogyris subterrestris petrina*) were found within the Survey Area. One nest of another species of *Camponotus* ant was found at tree survey point 070 (Figure 3), but ants from the nest were positively identified on site as (*C. nigriceps*). Samples of these ants were collected, and the identification was subsequently confirmed by Dr Brian Heterick at the Western Australia Museum.

4.1.1 Site Condition and Suitability

There were several ridges and topological undulations across the site that were dissected by dry creek beds opening onto seasonally dry shallow valleys and sheet flood plains. The soil substrate across most of the elevated areas was rocky and compacted, particularly along ridge lines. Habitat along many of the ridges was consistent with habitat at the type locality of ABAB at Lake Douglas; however, in lower areas the drainage was poor and most of the sandy soil had become compacted.

There is clear evidence that the site has been heavily disturbed during a long history of prospecting and mining within the Survey Area as is evident by numerous open mine shafts, mounds of overburden, tailings dumps, topsoil stockpiles, and litter associated with historic mining camps and operations. The site is also widely dissected by modern mining pits and infrastructure, access roads, haul roads and many smaller tracks, as well as the Great Eastern Highway, the Coolgardie-Esperance Highway, and the remains of a narrow-gauge railway.

The high levels of disturbance and the rocky substrate do not preclude *C.* sp. nr. *terebrans* from being present at the site even though it is now known that the type locality site, which shares similar characteristics with this Survey Area, was atypical.

4.2 *Jamenus aridus*

A total of 16 *Jalmenus aridus* adults (Plate 1) were identified at three locations within the Survey Area, one location near tree survey point 297 and two locations near tree survey point 274 (Figure 4; Table 4). The locations were in the south-western corner of the Survey Area (~4 km south of Coolgardie) and separated by approximately 500 m. No butterfly early stages nor any evidence of feeding damage or remains of the exoskeletons of *J. aridus* pupae were found.

Tree survey point 297 is in a sandy flood plain bordered with many *Senna artemisioides filifolia* plants that extend up the slopes on either side (Plate 2).

Tree survey point 274 is situated on a rocky ridge at the shallow head of an eroded creek-line with scattered *Senna artemisioides filifolia* plants growing along the creek line (Plate 3). This site represents a previously unrecorded habitat type for *J. aridus*. Butterflies were observed flying around *Eremophila alternifolia* and other flowering shrubs. Several of these plants were

inspected for the presence of *Froggattella kirbii* ants, which are known to associate with *J. aridus,* but only a small unidentified black ant was found.

Three *J. aridus* adults were collected for positive identification. Butterflies collected were lodged in the WAM as voucher specimens and as primary evidence for a new population within the Survey Area (Table 4).

Plate 1: *Jalmenus aridus* observed within the Survey Area

Plate 2: Habitat present at tree survey point 297

Plate 3: Habitat present at tree survey point 274

Table 4: *Jalmenus aridus* collected at Focused Minerals Ltd., Three Mile Project site at Coolgardie by R. Eastwood and M. Lohr in December 2021

WAM voucher	Date	Latitude	Longitude	Sighted	Collected
E113097	15 Dec 2021	-30.987295	121.164944	1 F	1 F
E113098	16 Dec 2021	-30.983250	121.166345	8 M	1 M
E113099	16 Dec 2021	-30.983693	121.166852	2 F, 2 M	1 F

5 Discussion

5.1 *Camponotus* sp. nr. *terebrans* and Arid Bronze Azure Butterflies

The ABAB was identified as potentially occurring the Survey Area in a flora and fauna desktop review conducted for a previous fauna survey (360 Environmental Pty Ltd 2022 (in prep)). Potentially suitable habitat containing smooth-barked eucalypts was observed during in the subsequent field survey (360 Environmental Pty Ltd 2022). The ABAB is listed as Critically Endangered under the *Biodiversity Conservation Act* 2016 and the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 due to their geographic distribution and low estimated number of mature individuals (Threatened Species Scientific Comitte, 2014). Detailed survey guidelines were published in September 2020 (Department of Biodiversity Conservation and Attractions, 2020b, 2020c).

Until recently, only two extant populations of ABAB are known, one at Barbalin Nature Reserve, Muckinbudin in the northern Avon Wheatbelt (Gamblin, Williams, Williams, & Richardson, 2009), and a second site approximately 100 km from Barbalin (Department of Biodiversity Conservation and Attractions, 2020a). Both sites are approximately 300 km west of the Survey Area at Coolgardie. In October 2021, two additional sites were discovered just north of Kalgoorlie (both by R. Eastwood). The type locality for ABAB is at Lake Douglas, 19-28 km north-east of the Survey Area; however, the butterfly and its host ant are now extinct at this location.

The butterfly is difficult to survey for, as adults are present for only a few weeks each year and may disperse through habitat unsuitable for breeding. Caterpillars of the ABAB are known to live only within the nests of an undescribed species of sugar ant (referred to as *Camponotus* sp. nr. *terebrans*), where they eat the ants' early stages and/or are fed by the ants. The ant nests may also be inhabited by leaf hoppers (*Pogonoscopus* spp. (Cicadellidae)), which the ants protect and in return feed on the anal excretions (honeydew) of the leaf hoppers. The ants are associated with smooth-barked eucalypt woodlands on sandy soil, but at the type locality for ABAB, the ants were found in rocky substrate along a ridge line (Rod Eastwood pers. obs.). Furthermore, *C.* sp. nr. *terebrans* ants are often found in disturbed sites (Field, 1999; McArthur, Adams, & Shattuck, 1997).

DBCA recommends surveying first for the ant and only looking for the butterfly at sites with large colonies of the host ant that could support an ABAB sub-population. Ant survey guidelines include a map of potential habitat for the host ant in WA, which includes large areas of woodland across the State (Department of Biodiversity Conservation and Attractions, 2020c). All significant *Camponotus* sp. nr *terebrans* colonies are assumed to be critical habitat for ABAB. The presence of ABAB in an ant colony is dynamic, since ABAB can disperse across the landscape and become established at new ant colonies, while existing colonies can decline over time.

5.1.1 Survey Outcomes

No *C.* sp. nr. *terebrans* (ABAB ants) or Arid Bronze Azure Butterflies (*Ogyris subterrestris petrina*) were found within the Survey Area. Areas with sandy substrate where *C.* sp. nr. *terebrans* is typically located were poorly drained and compacted, reducing their suitability.

The meat ant *Iridomyrmex purpureus* was found to be widespread and common across the majority of the Survey Area. This is very likely a contributing factor to the absence of *C.* sp. nr. *terebrans*, particularly in what is likely a marginal habitat for the *C.* sp. nr. *terebrans* ant. Only one nest of the related species, *C. nigriceps*, was found at tree survey point 070, but these ants are larger than *C.* sp. nr. *terebrans* and their nest architecture makes them less vulnerable to attacks from *I. purpureus*. *Camponotus nigriceps* is not associated with the ABAB.

5.2 *Jalmenus aridus*

The Inland Hairstreak, *Jalmenus aridus*, is listed as Priority 1 under the Biodiversity Conservation Act 2016 and, until recently, was only known from its type locality at Lake Douglas, approximately 12 km SW of Kalgoorlie. It was discovered in November 1983 breeding on a single *Acacia tetragonophylla*, but soon after its discovery the tree started to die, and the butterflies disappeared. Over the following decade, additional surveys resulted in collections of several specimens on a second *A. tetragonophylla* nearby, and a few specimens from a *Senna nemophilla* (= *S. artemisioides filifolia*) less than one km from the original tree (Williams, Williams, & Lundstrom, 1998). The last sighting of *J. aridus* at Lake Douglas was in 1999 (P. Samson pers. comm. 2021). A single specimen was found at Ngaanyatjarra approximately 460 km NE of Laverton in 1987 (ALA, 2022). Three additional populations of the species have recently been found north of Kalgoorlie. Most specimens have been recorded/collected in October or November, but there are a few records from mid-January and April.

Jalmenus aridus has a mutualistic association with the ant *Froggattella kirbii*. The butterfly larvae feed on the flowers and/or leaves of their host plant while the ants are in constant attendance. The larvae produce sweet secretions containing amino acids and sugars which the ants consume (Maschwitz, Margarete, & Schurian, 1975; Pierce, 1988). In return, the presence of the ants protects the butterfly larvae from parasitoids and predators. Larvae do not survive in the absence of their attendant ants (Pierce, 1988).

There are no guidelines for *J. aridus* surveys since it is difficult to predict when and where they might occur. Their attendant ant species has a wide but patchy distribution throughout open woodland areas across most of Australia (Shattuck, 1999) so the presence of ants cannot predict the likely presence of the butterfly, as is the case with ABAB and *C.* sp. nr. *terebrans*. The *J. aridus* host plant, *Senna artemisioides filifolia,* also has a distribution that covers most of WA and the distribution of their *Acacia tetragonophylla* host plant is even broader (Western Australian Herbarium, 2021). Furthermore, appearance of *J. aridus* adults – and other butterflies within the same genus – is highly irregular and strongly impacted by variation in local environmental conditions (Sands & New, 2002). The difficulty in surveying for this species as well as the limited

understanding of its habitat selection and timing of the emergence of adults likely all contribute to the lack of records of *J. aridus* outside of its type locality until recently.

5.2.1 Survey Outcomes

Jalmenus aridus adults were found at two sites within the Survey Area.

The environmental conditions at tree survey point 297 are similar to other known sites for *J. aridus*; however, no *Froggattella kirbii* ants were found. It is also possible that this subpopulation extends further up the creek line and outside the Survey Area across Nepean Road.

Although no *F. kirbii* were found at tree survey point 274, an unidentifiable ant was seen attending scale insects and leaf hoppers on the *Senna artemisioides filifolia* plants. It is unclear whether this unidentified ant has a relationship with *J. aridus*. If mutualisms exist between *J. aridus* and additional ant species, its suitable habitat may be more extensive than currently documented.

Determining the extent of *J. aridus* populations within the Survey Area was outside of the scope of this project, however, aerial imagery suggests that similar habitat to the locations where it was observed is abundant in vicinity of the Survey Area. These habitats appear to extend into land under conservation tenure in adjacent portions of the Kangaroo Hills Timber Reserve.

6 Conclusion

- No ABAB host ants (*Camponotus* sp. nr. *terebrans*) or Arid Bronze Azure Butterflies (*Ogyris subterrestris petrina*, CR, DBCA EPBC) were found within the Survey Area despite a comprehensive search.
- It is unlikely that the ABAB ants could colonise the marginal habitat within the Survey Area in the foreseeable future due to the presence of large numbers of *Iridomyrmex purpureus* ants.
- Adult Inland Hairstreak butterflies (*Jalmenus aridus*, P1, DBCA) were observed at three locations within the Survey Area.
- The observation of *J. aridus* at sites approximately 500 m apart was unexpected, but it is an important addition to the known populations of this Priority 1 listed species. The discovery of *J. aridus* in habitat which is substantially different to habitat used by its other known populations suggests its distribution may be larger than currently documented.

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8 Report Disclaimer

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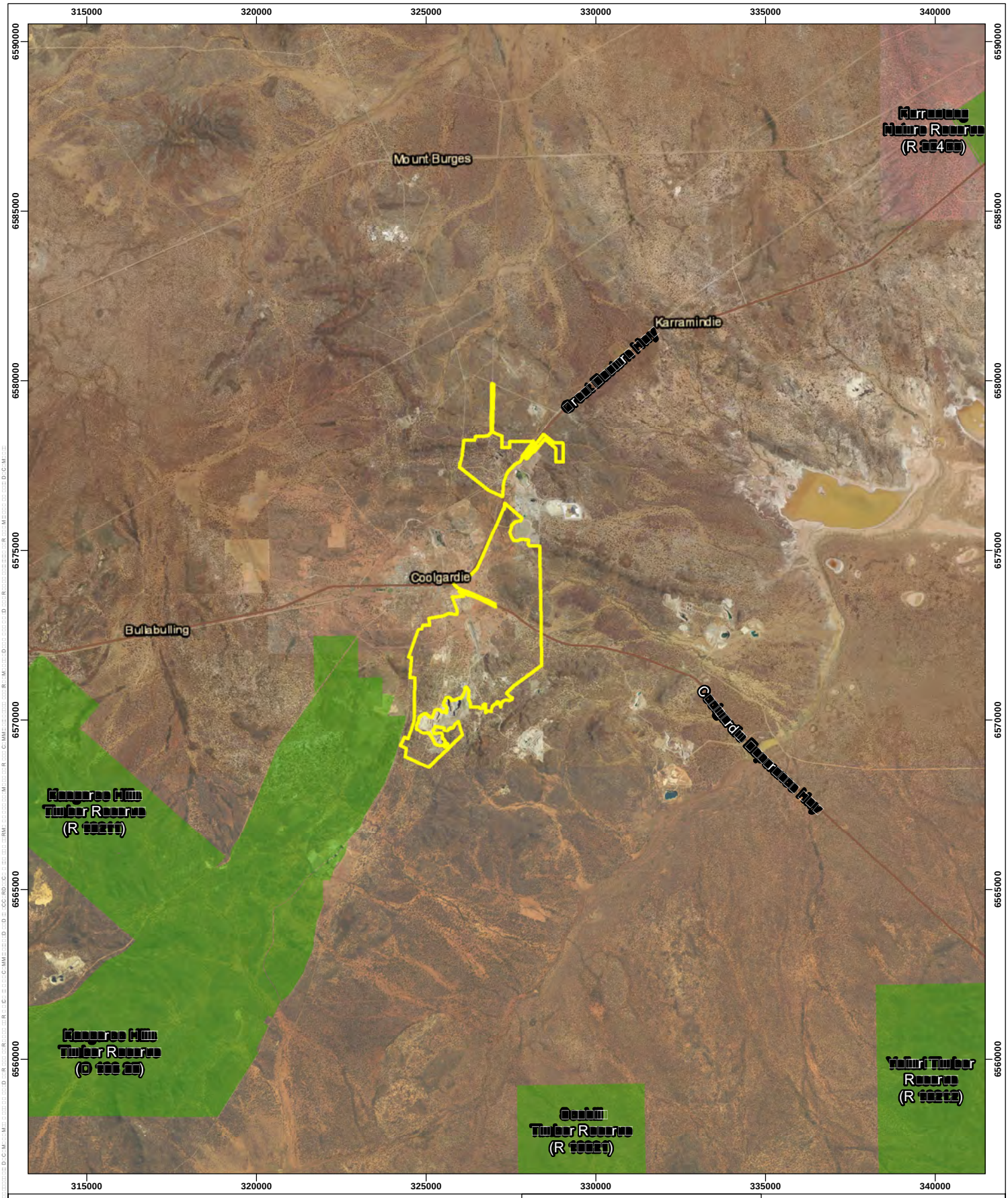
Figures



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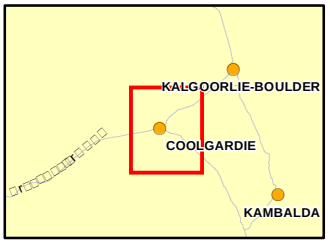

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Focus Minerals Limited

Coolgardie

Coolgardie *Camponotus* sp. nr. *terebrans* Targeted Survey

Figure 1

Survey Area and Conservation and Environmentally Sensitive Areas

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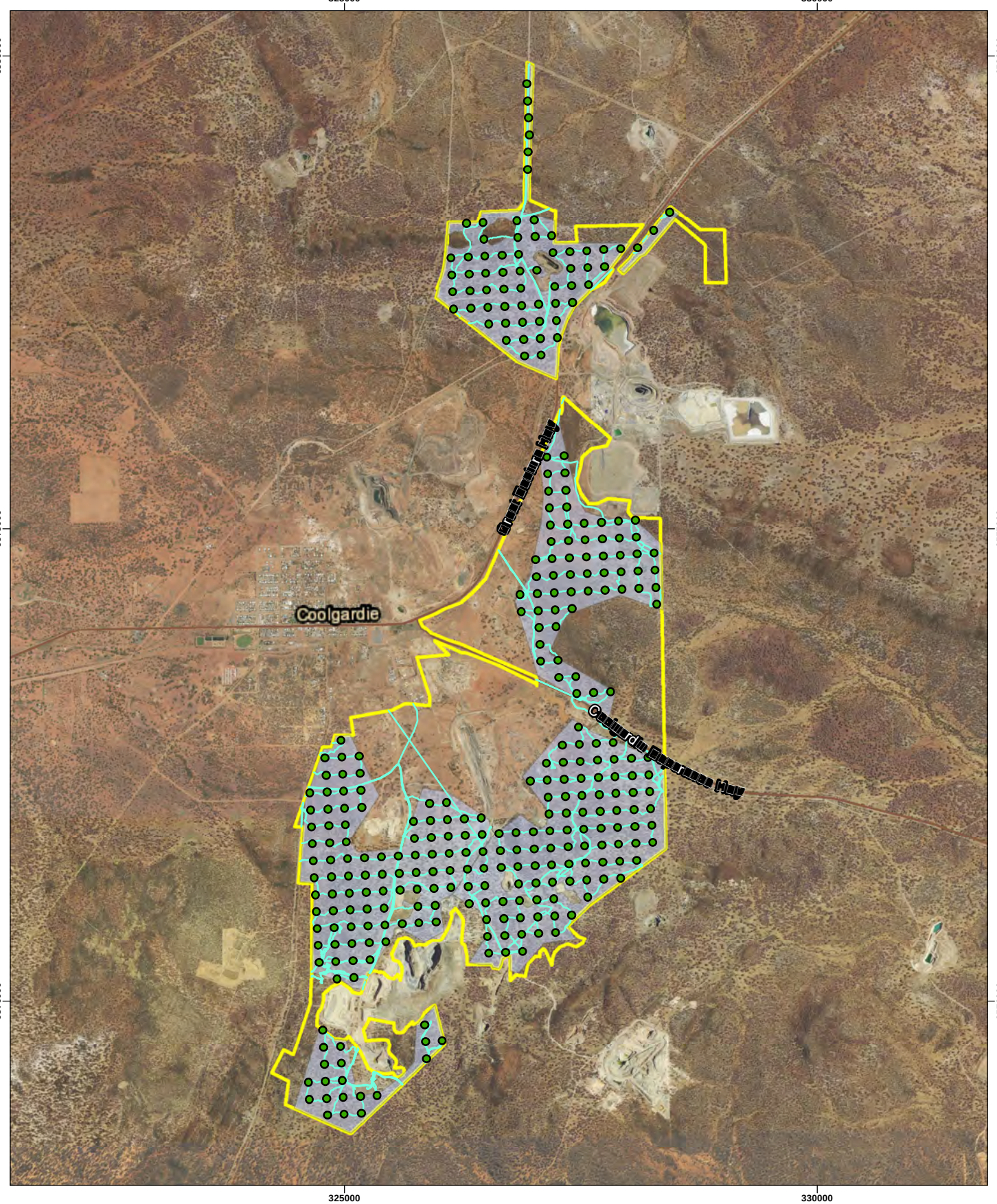

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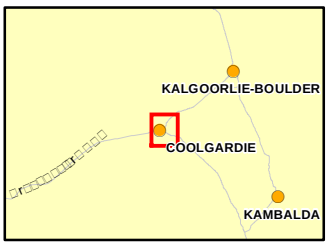

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Focus Minerals Limited

Coolgardie

Coolgardie *Camponotus* sp. nr. *terebrans* Targeted Survey

Figure 2

Potential ABAB Habitat and Survey Effort

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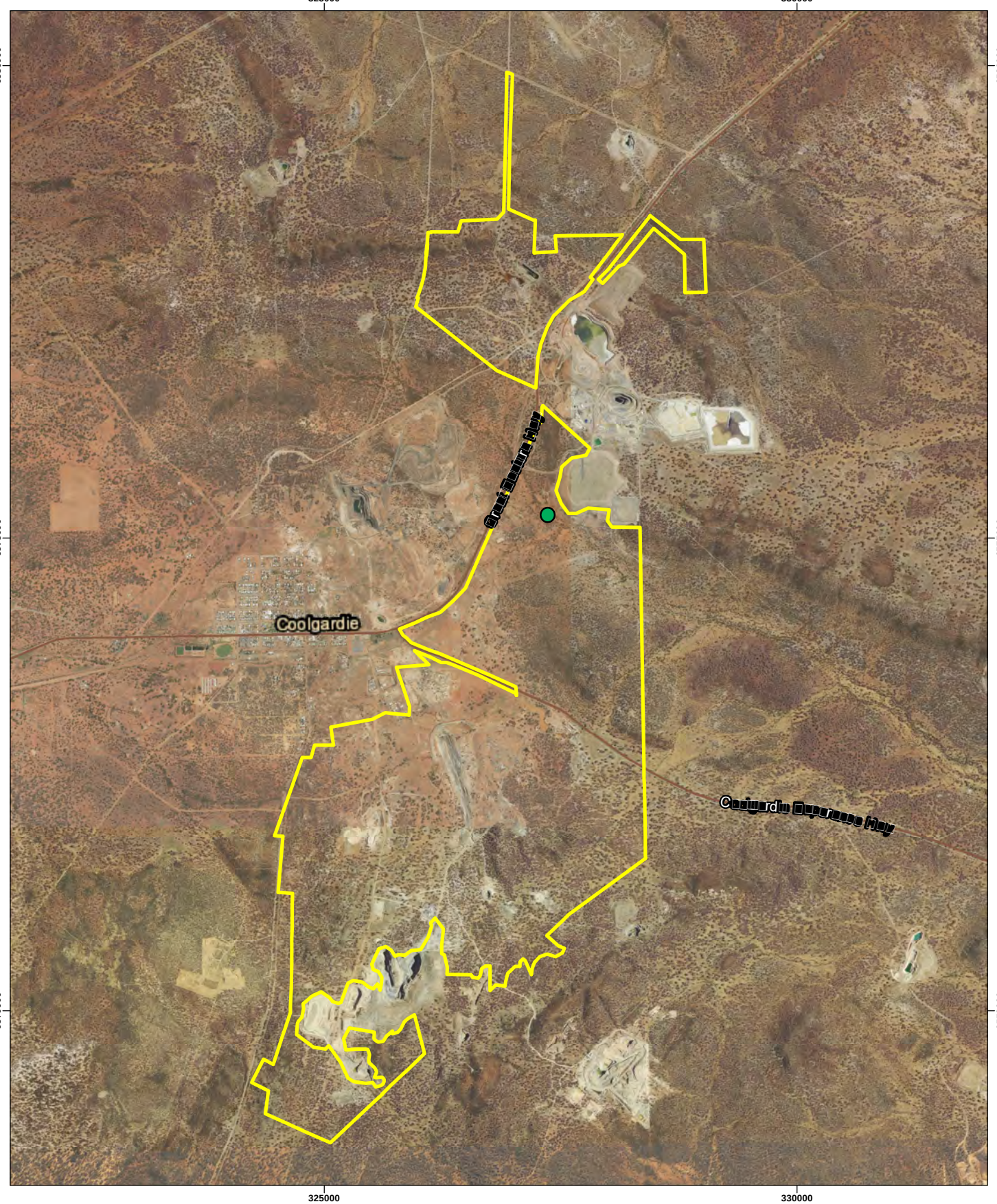

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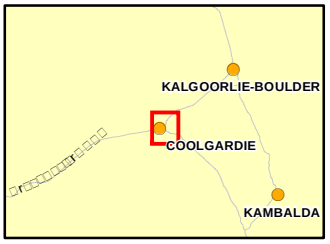

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Coolgardie

Coolgardie *Camponotus* sp. nr. *terebrans* Targeted Survey

Figure 3

***Camponotus nigriceps* Nest**

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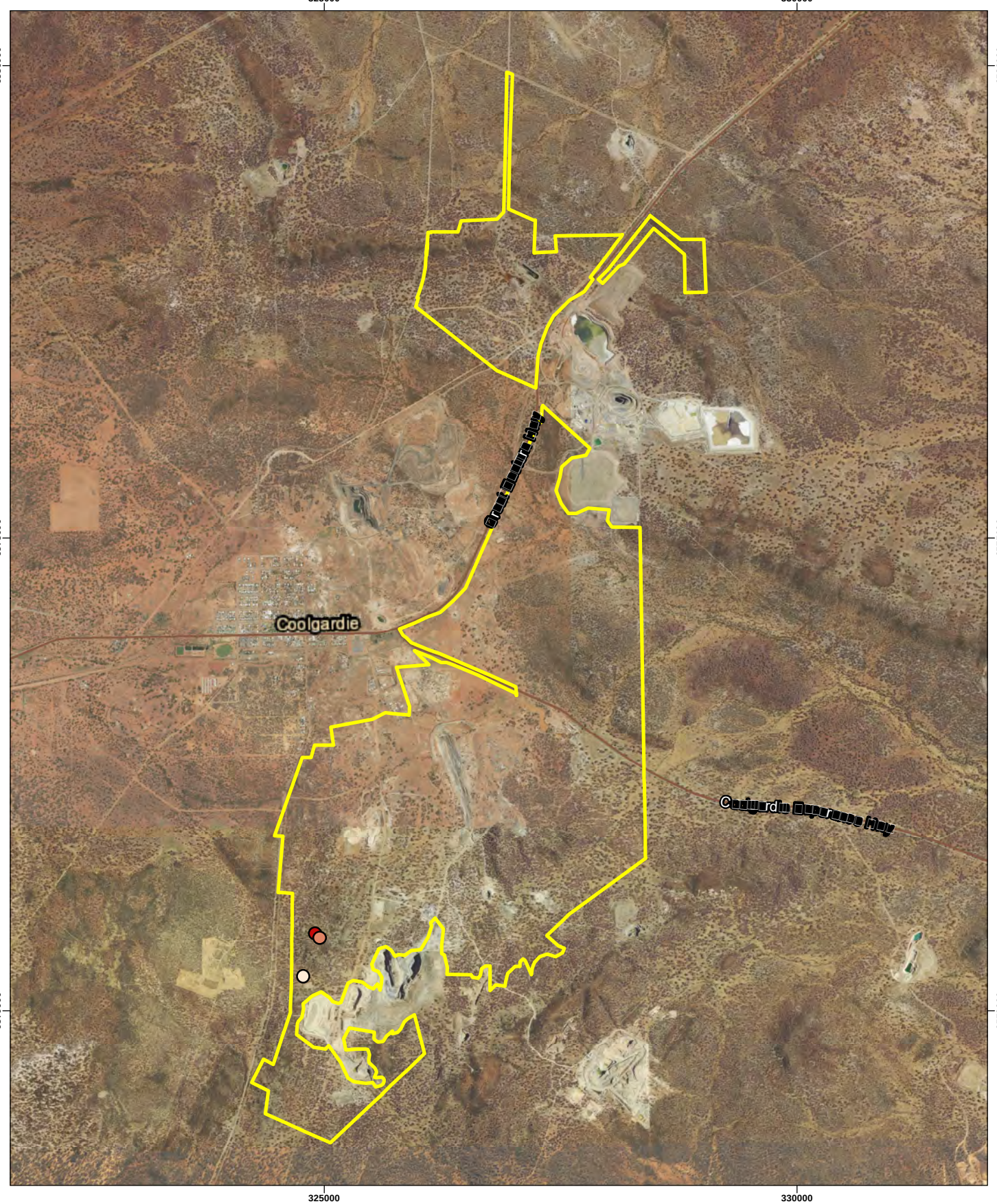

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Survey Area

Inland Hairstreak (*Jalmenus aridus*) Locations

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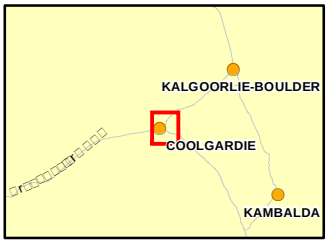

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Focus Minerals Limited

Coolgardie

Coolgardie *Camponotus* sp. nr. *terebrans* Targeted Survey

Figure 4

Inland Hairstreak (*Jalmenus aridus*) Locations and Numbers Observed Nest

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Terratree

Targeted Flora and Vegetation Survey - Coolgardie Gold Project

Prepared for Focus Minerals

Ref: T20040

ecological assessment
& management

Document Control

Revision	Details	Date	Author	Reviewer
Rev 0	Draft for Internal Review	27/02/2021	H. Legge	J. Grehan
Rev A	Draft for Submission to Client	01/03/2021	H. Legge	G. Blick
Rev B	Draft for Submission to Client	15/03/2021	H. Legge	G. Blick
Rev C	Revised final draft for Submission to Client	10/05/2021	H. Legge	G. Blick
Rev D	Final Report	23/06/2021	H. Legge	G. Blick

Joseph Grehan

Principal Ecologist

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Abbreviations and Acronyms

BAM Act	*Biosecurity and Agriculture Management Act 2007*
BC Act	*Biodiversity Conservation Act 2016*
BoM	Bureau of Meteorology
CALM	former Department of Conservation and Land Management (now DBCA), WA Government
CALM Act	*Conservation and Land Management Act 1984*
DAFWA	former Department of Agriculture and Food Western Australia (now DPIRD), WA Government
DBCA	Department of Biodiversity, Conservation and Attractions, WA Government
DEC	former Department of Environment and Conservation (now DBCA), WA Government
DEE	Department of the Environment and Energy, Australian Government
DPIRD	Department of Primary Industries and Regional Development, WA Government
DWER	Department of Water and Environmental Regulation, WA Government
EPA	Environmental Protection Authority, WA Government
EPBC Act	*Environment and Protection and Biodiversity Conservation Act 1999*
EP Act	*Environment Protection Act 1986*
ESA	Environmentally Sensitive Area
EWSWA	Environmental Weed Strategy for Western Australia
GDA94	Geocentric Datum Australia 1994
GPS	Global Positioning System
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature
PEC	Priority Ecological Community
TEC	Threatened Ecological Community
TPFL	Threatened and Priority Flora

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Executive Summary

Focus Minerals Ltd (Focus) commissioned Terratree Pty Ltd (Terratree) to undertake a Targeted flora and vegetation survey (formerly level 1) within their Coolgardie project area. The objective of the survey was to determine the presence of Threatened and Priority Flora and other species of conservation significance and Threatened and Priority Ecological Communities within the project area. This survey was undertaken in conjunction with a Basic fauna survey, the results of which will be in a separate report prepared by Western Ecological. The results of these surveys will inform future exploration programmes and associated environmental approval applications.

The Focus Coolgardie Project (hereafter referred to as 'the survey area') is located adjacent to Coolgardie on the south-east side. The survey area totals approximately 885 hectares (ha), over 300 ha of which is highly disturbed and degraded.

The Targeted flora and vegetation survey consisted of a desktop assessment followed by a field survey, conducted in accordance with the Environmental Protection Authority's (EPA) *Technical Guidance for Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016b) and applied in conjunction with the *Environmental Factor Guideline for Flora and Vegetation* (EPA 2016a).

The desktop review aimed to identify Threatened and Priority Flora and Ecological Communities previously recorded within the survey area and surrounds. This involved a review of previous studies, literature and relevant spatial databases as well as analysis of aerial imagery, broadscale vegetation and landscape feature spatial data to identify expected vegetation assemblages and significant landscape features.

The Targeted Flora and Vegetation field survey was conducted between the 16th and 20th of November 2020 by Principal Ecologist/Botanist Joseph Grehan and Senior Ecologist Heather Legge of Terratree.

The survey area was extensively travelled by vehicle and foot to verify and define vegetation communities and to search for Threatened or Priority flora identified as potentially occurring within the survey area during the desktop review. Relevés and opportunistic sampling were conducted to delineate vegetation communities and search for Targeted species.

Where species could not be identified in the field, they were collected, labelled, pressed, dried and frozen in accordance with the requirements of the WA Herbarium. Subsequently, their identification was confirmed by Senior Botanist-Taxonomist, Kathya Tippur, by comparing collections with pressed specimens housed at the herbarium and using taxonomic keys and other reference materials.

Some specimens collected could only be identified to genus level, due to being sterile that the time of survey. Any specimens that could only be identified to genus level were reviewed to see whether they were from

genera listed in the Targeted species list. In cases where they were of Targeted genera, an attempt was made by the botanist to rule out the Targeted species. If this was not possible, a desktop assessment was undertaken to determine the likelihood of these Threatened and Priority species occurring within the survey area.

A total of 95 species of flora from 28 families were recorded within the survey area. One Priority species, *Acacia websteri* (P1) was recorded. No Threatened Flora species were recorded.

Acacia websteri (P1) was identified after the field survey, and it is possible that this species could exist in multiple populations throughout the survey area. A follow-up Targeted survey should be conducted in areas of suitable habitat associated with Acacia and Allocasuarina dominated (Community 4) to determine the exact location and extent of this species in the survey area. *Acacia websteri* (P1) has distinctive features on the leaves and can be identified by close examination of the leaves, without the need for flowers or fruit. This allows flexibility of timing of this targeted search.

Nine of the 100 specimens collected could not be identified to species level because they were sterile at the survey time. Of these, four specimens were from genera of seven Priority species listed in the desktop review. The assessment of the likelihood of these Targeted Priority flora occurring within the survey area was conducted, which found one species, *Eremophila veronica* (P3), to be Very Likely, and one other species, *Austrostipa blackii* (P2), to be Likely to occur within the survey area. The other five targeted species were considered Unlikely to occur. Examination of the collected specimens compared with the Targeted species determined that it is unlikely any of the collected specimens are targeted species. *Eremophila veronica* (P3) can be ruled out entirely due to its distinctive foliage. *Austrostipa blackii* (P2) could not be ruled out, and future Spring searches Targeting *Austrostipa blackii* (P2), should be considered if disturbance is planned in drainage line areas associated with Community 3.

The survey area is dominated by Eucalypt Mallee Woodlands and Open Woodlands with small Mallee Shrublands areas and one Isolated Heathland. Seven distinct communities were observed within the survey area. No Threatened or Priority Ecological Communities (TECs or PECs) and No Environmentally Sensitive Areas (ESAs) were observed within the survey area.

A large portion, 340.7ha (38.5%), of the survey area was Degraded to Completely Degraded. 325.6ha (36.9%) remain in Good condition, and 217.7 ha (24.6%) remain in Very Good condition.

Five introduced species were recorded, including two Weed of National Significance (WONS), *Lycium ferocissimum* (African Boxthorn) and *Opuntia stricta* (Common Prickly Pear), which is also a Declared Pest s22(2) (C3 Restricted). Control measures are required a Declared Pest s22(2) (C3 Restricted) and therefore must be implemented for *Opuntia stricta*. Both species are highly invasive, and management actions should be undertaken for both species.

Terratree makes the following recommendations for the survey area:

- Avoid in the first instance, and, if unavoidable minimise and mitigate impacts t *Acacia websteri* (P1) flora and the vegetation communities that this species is associated with (Communities 4) until the species exact location and extent can be determined.
- Follow-up Targeted surveys should be in accordance with EPA Guidance (2016b) in late Autumn to search for *Acacia websteri* (P1) in Community 4.
- Consider a Targeted search for *Austrostipa blackii* (P2) in Community 3, drainage lines, in Spring if disturbance activities are planned in these areas.
- Undertake development activities so as to avoid incidental impacts to vegetation in Good to Very Good Condition wherever possible.
- Develop and implement a hygiene management plan to prevent the introduction and spread of introduced flora and pathogens
- Conduct weed eradication and control measures for WONS and Declared Pest species recorded, *Lycium ferocissimum* (African Boxthorn) (WONS) and *Opuntia stricta* (Common Prickly Pear) (WONS and Declared Pest).

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1 Introduction

1.1 Background

Focus Minerals Ltd (Focus) commissioned Terratree Pty Ltd (Terratree) to undertake a Targeted flora and vegetation survey within their Coolgardie project area. The objective of the survey was to determine the presence of Threatened and Priority Flora and other species of conservation significance and Threatened and Priority Ecological Communities within the project area. This survey was undertaken in conjunction with a Basic fauna survey, the results of which will be in a separate report prepared by Western Ecological. The results of these surveys will inform future exploration programmes and associated environmental approval applications.

1.2 Project Location and Size

The Focus Coolgardie Project (hereafter referred to as 'the survey area') is located adjacent to Coolgardie on the south-east side (**Figure 1**). The survey area is on the south-east of Nepean Rd and along Great Eastern Hwy and is comprised of three sections which are referred to in figures as 'South', 'Mid' and 'North'. The two largest sections lie less than 1 kilometre (km) from Coolgardie and are divided in two by the Coolgardie-Esperance Highway. The third and smallest section of the survey area lies approximately 5km further north-east along Great Eastern Hwy.

The survey area totals approximately 885 hectares (ha), over 300 ha of which is highly disturbed and degraded.

1.3 Scope of Work

The scope of work for the project included the following:

- Conduct a desktop assessment to determine the broad environmental values of the survey area and surrounds and to identify Threatened Ecological Communities (TECs), Priority Ecological Communities (PECs), Threatened or Priority Flora species that could potentially occur within the survey area.
- Undertake a Targeted flora and vegetation field survey of the survey area.
- Produce an inventory of the flora and vegetation communities present and
- Produced figures showing the location of any TECs, PECs or Threatened or Priority Flora if present.
- Produce figures showing the extent of the vegetation communities recorded.
- Produce figures showing the extent of any variation in vegetation condition observed.
- Prepare a comprehensive technical report detailing the results of the desktop assessment and field survey.
- Make management recommendations to avoid in the first instance, and, if unavoidable minimise and mitigate impacts to significant conservation values.

2 Regulatory Context

2.1 Relevant Legislation and Guidance

2.1.1 Government Legislation

The following legislation applies to flora, vegetation and the protection of biodiversity in Western Australia:

- Biodiversity Conservation Act 2016 (BC Act) (WA)
- Biosecurity and Agriculture Management Act 2007 (BAM Act) (WA)
- Conservation and Land Management Act 1984 (CALM Act) (WA)
- Environmental Protection Act 1986 (EP Act) (WA)
- Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) (Commonwealth).

2.1.2 Government Regulatory Guidelines

The following regulatory guidelines apply to flora, vegetation and the protection of biodiversity in Western Australia:

- Environmental Factor Guideline – Flora and Vegetation (EPA 2016a)
- Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual (EPA 2020)
- Environmental Protection (Clearing of Native Vegetation) Regulation 2004
- Environmental Protection (Environmentally Sensitive Areas) Notice 2005
- Guidance Statement No. 33 – Environmental Guidance for Planning and Development (EPA 2008)
- Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016b)

2.2 Threatened and Priority Flora and Ecological Communities

2.2.1 Biodiversity Protection in Western Australia

Biodiversity in Western Australia is protected, managed and assessed under international, national and state agreements, legislation and policy. For Environmental Impact Assessment, the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the Western Australian *Biodiversity Conservation Act 2016* (BC Act) are of relevance to WA flora, fauna and ecological communities.

2.2.2 *Biodiversity Conservation Act 2016* (WA)

At the State level, the BC Act provides protection for any native plant or animal species that is indigenous to Western Australia. Any activity in Western Australia that involves taking part of or the whole of a WA native plant or animal (including damage caused by human activities) may require a licence or permit to do so.

Under the BC Act, flora and fauna that have been adequately searched for and are deemed to be either rare or in danger of extinction are gazetted as Threatened species. Specially Protected species (e.g. migratory

animals) in need of special protection in the wild are provided with a separate categorisation under the Act. A third category exists for species considered to be Extinct.

The Threatened Species Scientific Committee provides advice to the Minister for Environment on the listing of flora and fauna species to be protected under the BC Act. Threatened species are categorised according to their level of threat using IUCN Red List criteria:

- Critically Endangered – considered to be facing an extremely high risk of extinction in the wild
- Endangered – considered to be facing a very high risk of extinction in the wild in the near future
- Vulnerable – considered to be facing a high risk of extinction in the wild in the medium-term future.

At the State level, the term 'Threatened' is commonly used to refer to all species under the classification of Threatened, regardless of their Commonwealth status.

Ecological communities are naturally occurring groups of plant, animals and other organisms that interact within a unique habitat. Under the BC Act, Threatened Ecological Communities (TECs) are now protected through a statutory listing. The Threatened Ecological Communities Scientific Committee provides advice to the Minister for Environment on the listing of ecological communities to be protected under the BC Act. TECs are categorised according to their level of threat:

- Critically Endangered
- Endangered
- Vulnerable
- Presumed Totally Destroyed.

Annually, a government gazette listing current Threatened and Extinct species under the BC Act is issued by the Western Australian Government and listed on the DBCA website. These taxa are legally protected and their removal, or impact to their surroundings, cannot be conducted without Ministerial approval, obtained specifically on each occasion for each population. As the BC Act is transitioning from the Wildlife Conservation Act 1950, the current lists are scheduled under the previous legislation and contain only flora and fauna species, not ecological communities. However, the current list of TECs has been endorsed by the Minister of Environment.

DBCA maintains lists of Priority flora and fauna species and ecological communities. These are taxa that are considered poorly known, uncommon or under threat but for which there is insufficient justification, based on known distribution and population sizes, for inclusion as Threatened species or TECs under the BC Act. The categories for Priority species and ecological communities give an indication of the priority for undertaking further surveys based on the number of known sites and degree of threat to those populations.

The DBCA lists are reviewed annually and published on their website, and include all Threatened, Extinct and Priority species and Threatened and Priority ecological communities in WA. DBCA enforces regulations under the BC Act to conserve all Threatened and Priority flora, fauna and ecological communities in WA and protect significant populations.

Conservation codes used for WA flora, fauna and ecological communities are provided in **Appendix A** (**Tables A.1** and **A.2**).

2.2.3 *Environment Protection and Biodiversity Conservation Act 1999*

At a Commonwealth level, threatened flora, fauna and ecological communities are protected under the EPBC Act. The species and ecological communities protected at the State level may be different to those protected at the Commonwealth Level (and vice versa). It is therefore important to confirm their status at both State and Commonwealth levels.

Under the provisions of the EPBC Act, proposed actions that potentially have a significant impact on a matter of national environmental significance must be referred to the Commonwealth Department of the Environment and Energy (DEE), and potentially for the approval of the Commonwealth Minister for the Environment, for a decision as to whether an assessment is required under the provisions of the Act. The matters of national environmental significance are:

- world heritage properties
- national heritage places
- wetlands of international importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed)
- nationally threatened species and ecological communities
- migratory species
- Commonwealth marine areas
- the Great Barrier Reef Marine Park
- nuclear actions (including uranium mining)
- a water resource, in relation to coal seam gas development and large coal mining development.

The EPBC Act categorises Threatened species are according to their level of threat:

- Extinct
- Extinct in the wild
- Critically endangered
- Endangered
- Vulnerable

- Conservation Dependent.

Threatened Ecological Communities are protected under the following categories under the EPBC Act:

- Critically Endangered
- Endangered
- Vulnerable.

Conservation codes used for Australian flora and TECs protected under the EPBC Act are provided in **Appendix A** (**Tables A.3** and **A.4**).

2.3 Environmentally Sensitive Areas

Under the Western Australian *Environmental Protection Act 1986* (EP Act), it is an offence to clear native vegetation without a permit or unless an exemption applies. The *Environmental Protection (Environmentally Sensitive Areas) Notice 2005* declares Environmentally Sensitive Areas (ESAs) to include:

- defined wetlands and riparian vegetation within 50 m of these
- areas covered by Threatened Ecological Communities
- areas of vegetation within 50 m of rare flora
- Bush Forever sites
- declared World Heritage property sites
- areas included on the Register of the National Estate because of their natural heritage values.

Under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*, exemptions for low impact routine and management practices do not apply to ESAs and a clearing permit is required.

2.4 Introduced Flora (Weeds)

2.4.1 Impacts and Sources of Weeds

When introduced flora are establish an existing native vegetation complex, ecological and landscape values can be negatively impacted. Impacts from weeds include, but are not limited to:

- competition with native flora for light, water, space and nutrients
- introduction of associated plant pathogens and pests
- reduced floristic diversity
- altered vegetation structure
- increased risk of soil erosion in some instances
- altered fire regimes.

Weeds can be introduced into existing vegetation complexes by a variety of vectors, both natural and human influenced. Several of these, including wind, surface water and fauna, are naturally occurring processes. Human activities and influences which can introduce exotic flora species into an area include, but are not limited to:

- wheels and machinery, digging/drilling components, etc. that contain plant material or seeds
- altered surface water flow
- introduction of exotic fauna
- disturbance to vegetation and/or soil.

2.4.2 Weeds of National Significance (WONS)

At a national level, there are 32 weed species listed as Weeds of National Significance (WONS) (DAWE2021). These are plants that have been selected for their invasiveness and impact characteristics, potential and current area of spread and their primary industry, environmental and socioeconomic impacts. The Australian Weeds Strategy 2017–2027 (IPAC 2017) describes the broad goals and objectives in managing weeds in Australia, including WONS species. Many Weeds of National Significance are also declared pests under the BAM Act in WA.

2.4.3 Declared Pest Plants

The *Biosecurity and Agriculture Management Act 2007* (*BAM Act*) seeks to prevent serious animal and plant pests and diseases from entering Western Australia and becoming established, and to minimise the spread and impact of any that are already present. The Minister for Agriculture can categorise an organism as a declared pest under the *BAM Act* if:

- it has or may have an adverse effect on another organism in the area; or human beings in the area; or the environment, or part of the environment, in the area; or agricultural activities, fishing or pearling activities, or related commercial activities, carried on, or intended to be carried on, in the area
- it may have an adverse effect on any of those things if it were present in the area, or if it were present in the area in greater numbers or to a greater extent.

The Western Australian Organism List lists organisms and their legal status in Western Australia under the *BAM Act* (DPIRD 2021) (**Table 1**).

Table 1: Legal status of organisms under the *BAM Act*

Status	Description
Declared Pest, Prohibited - s12	Prohibited organisms are declared pests by virtue of section 22(1), and may only be imported and kept subject to permits. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions.
Declared Pest - s22(2)	Declared pests must satisfy any applicable import requirements when imported, and may be subject to an import permit if they are potential carriers of high-risk organisms. They may also be subject to control and keeping requirements once within Western Australia.
Permitted - s11	Permitted organisms must satisfy any applicable import requirements when imported. They may be subject to an import permit if they are potential carriers of high-risk organisms.
Permitted, Requires Permit - r73	Regulation 73 permitted organisms may only be imported subject to an import permit. These organisms may be subject to restriction under legislation other than the Biosecurity and Agriculture Management Act 2007. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions.
Unlisted - s14	If you are considering importing an unlisted organism/s you will need to submit the name/s for assessment, as unlisted organisms are automatically prohibited entry into WA.

The *Biosecurity and Agriculture Management Regulations 2013* categorises declared pests into four control categories (DPIRD 2021) (Table 2).

Table 2: Control categories for declared pests

Declared Plant Category	Description
C1 - Exclusion	Organisms which should be excluded from part or all of Western Australia.
C2 - Eradication	Organisms which should be eradicated from part or all of Western Australia.
C3 - Management	Organisms that should have some form of management applied that will alleviate the harmful impact of the organism, reduce the numbers or distribution of the organism or prevent or contain the spread of the organism.
Unassigned	Unassigned: Declared pests that are recognised as having a harmful impact under certain circumstances, where their subsequent control requirements are determined by a Plan or other legislative arrangements under the Act.

Under the BAM Act, a local government can also declare a plant to be a 'pest plant', so long as it is not already a declared plant under the Act. These plants are gazetted under a local government's local laws and allow control to be enforced on any private land within a local government's boundaries. A local law can be made for the purpose of:

> "prescribing as a pest plant in that district any plant (other than a declared pest for that area) that, in its opinion, is likely to adversely affect the environment of the district, the value of property in the district or the health, comfort or convenience of the inhabitants of the district" (BAM Act).

2.4.4 Environmental Weeds

The State of the Environment Report (EPA 2007) states that Western Australia has over 1200 recognised weeds species. The Environmental Weed Strategy for Western Australia (EWSWA; CALM 1999) rated all weeds known in Western Australia at the time of publication according to their invasiveness, distribution and environmental impacts (**Table 3**). The weeds were classified into four categories: High, Moderate, Mild and Low. High-rated species are those that all three criteria apply to, and Moderate-rated species are those where only two of the criteria apply. The EWSWA assessed 1,350 weed species recorded in Western Australia, with 34 weed species classified as High.

Table 3: Criteria for Environmental Weeds Strategy rating (CALM 1999)

Criteria	Description
Invasiveness	Ability to invade bushland in good to excellent condition or ability to invade waterways.
Distribution	Wide current or potential distribution including consideration of known history of widespread distribution elsewhere in the world.
Environmental Impacts	Ability to change the structure, composition and function of ecosystems. In particular, an ability to form a monoculture in a vegetation community.

3 Existing Environment

3.1 Biogeography

The Interim Biogeographic Regionalisation for Australia (IBRA) has defined 89 bioregions and 419 subregions across Australia, based on climate, geology, landforms, native vegetation and species (DEE 2012). These provide a useful method for reporting biodiversity patterns and categorising survey areas. The survey area is located within the Coolgardie Region, in the Eastern Goldfields (COO3) IBRA subregion (DEE 2018).

A biodiversity audit of Western Australia's subregions classified this subregion as follows:

> "Coolgardie 3 Eastern Goldfields subregion 3 lies on the Yilgarn Craton's 'Eastern Goldfields Terrains'. The relief is subdued and comprises of gently undulating plains interrupted in the west with low hills and ridges of Archaean greenstones and in the east by a horst of Proterozoic basic granulite. The underlying geology is of gneisses and granites eroded into a flat plane covered with tertiary soils and with scattered exposures of bedrock. Calcareous earths are the dominant soil group and cover much of the plains and greenstone areas. A series of large playa lakes in the western half are the remnants of an ancient major drainage line (Cowan 2001)".

3.2 Regional Vegetation

The Coolgardie IBRA region lies within South-Western Interzone Botanical Province as described by Beard (1990) which represents a transition zone between the wetter South-West and the more arid Eremaean Botanical Provinces. This interzone covers the transition in vegetation from spinifex and mulga in the east to eucalypt woodlands in the west (Bastin and ACRIS Management Committee 2008).

Coolgardie Eastern Goldfields subregion is described as mallees, acacia thickets and shrub-heaths on sandplains with diverse eucalypt woodlands occurring on ranges, valleys and around salt lakes which support dwarfed halophyte shrublands of samphire (Cowan 2001).

The vegetation sub-system association at the survey area is comprises of medium woodland dominated by *Eucalyptus torquata*, *E. lesouefii*, *E. clelandii* (now *E. clelandiorum*), *E. campaspe*, and *Casuarina cristata* over sparse shrublands of *Eremophila scoparia*, *Eremophila glabra, Eremophila oldfieldii*, *Acacia* spp., *Dodonaea lobulata* over a chenopod shrub layer (such as *Atriplex* spp. and *Maireana* spp.) (Beard *et al* 2013; DPIRD 2019b).

3.3 Soils and Landforms

Landforms of the Coolgardie bioregion comprise of rocky granite outcrops, low greenstone hills, laterite uplands and broad plains dissected by many salt lakes (Bastin and ACRIS Management Committee 2008).

High-level hierarchical landscape and soil zone mapping by the Department of Agriculture and Regional Development (DPIRD) classified the survey area as lying in the Norseman Soil-Landscape Zone within the Kalgoorlie Soil Province (DPIRD 2019c). The landforms of the Kalgoorlie soil province are undulating plains, with some sandplains, hills and salt lakes on granite and greenstone of the Yilgarn Craton (Tille 2006). Characteristics of these soil-landscapes are listed in **Table 4**.

Table 4: Soils and landforms within the Coolgardie Project survey area

Soil Landform Hierarchy	Description
Soil System Summary (DPIRD 2019c)	**266_BB5** Rocky ranges and hills of greenstones-basic igneous rocks.
Soil Province (Purdie *et al* 2004)	**Kalgoorlie** Laterised plateau on Precambrian granites and gneisses with greenstone belts. Saltlake chains with much dissection near major salt lakes. Aeolian dust present. Soils may be calcareous, but red-brown hardpans are uncommon.
Soil Zone (Tille 2006)	**Norseman** Undulating plains and uplands (with some sandplains and salt lakes) on granitic rocks of the Yilgarn Craton. Calcareous loamy earths, yellow sandy and loamy earths, red loamy earths, red deep sands and salt lake soils.

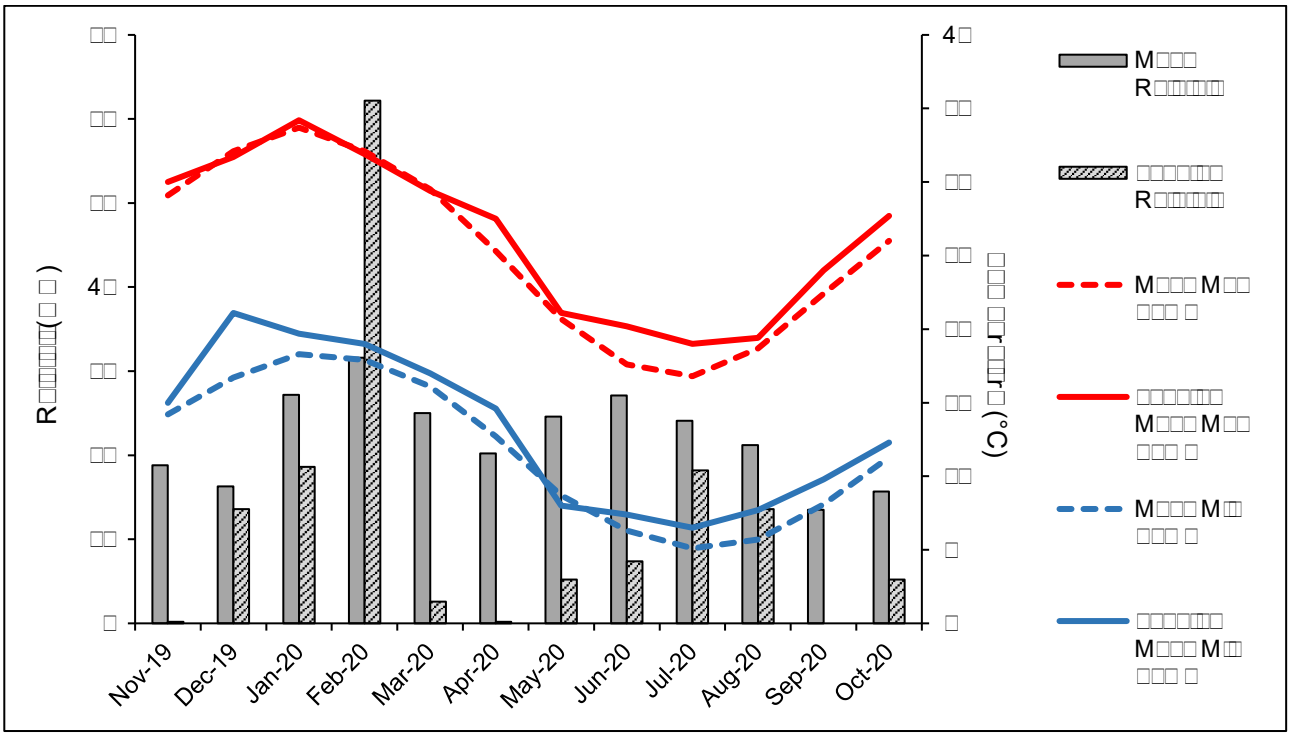
3.4 Climate

The bioclimate of the Coolgardie Eastern Goldfields subregion is described by Beard (1990) as mainly Sub-Eremaean, having an arid to semi-arid climate with 200-300 mm of annual rainfall.

The survey area lies in the warm and persistently dry 'Arid Grasslands' (Bws), Köppen Climate Class as classified by Peel *et al* (2007) and within the 'hot dry summer - cold winter' climate category with winter dominated rainfall as classified by the Bureau of Meteorology (BoM 2016).

Although closer to the survey area, the Coolgardie weather station lacks data from recent years. As such, data weather data has been obtained from the Kalgoorlie-Boulder Airport BoM weather station (no. 12038), 33.3km away. Temperature and rainfall data recorded at this weather station are shown in **Graph 1**. Monthly mean

temperatures were close to, although generally slightly higher than long-term mean records. In the twelve months preceding the survey, the area received 147mm rainfall, which is below the long term average annual rainfall of 265mm. November 2019, and March, April, May June, September and October 2020 where notably drier than average. However, considerable rainfall fell in February, which received 62.2mm. July and August received 18.2mm and 13.6mm respectively, slightly below average, however, climate was not considered a limitation to the survey.



Graph 1: Rainfall and temperature data for Kalgoorlie-Boulder Airport weather station no. 12038 (BoM 2021).

3.5 Historical Land Use and Disturbance

Dominant land uses in the area include Unallocated Crown Land (UCL), grazing on native pastures leaseholds, Aboriginal land, freehold land, mining leases and nature reserves (Bastin and ACRIS Management Committee 2008; Cowan 2001). Gold and nickel mining is important to the region's economy, which is supplemented by pastoral activity and tourism. Kalgoorlie, Coolgardie and Norseman are the region's major populations centres (Bastin and ACRIS Management Committee 2008).

4 Methods

The Targeted flora and vegetation survey (formerly Level 1) consisted of a desktop assessment followed by a field survey, conducted in accordance with the Environmental Protection Authority's (EPA) *Technical Guidance for Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016b) (hereafter referred to as the 'EPA Guidance') and applied in conjunction with the *Environmental Factor Guideline for Flora and Vegetation* (EPA 2016a).

4.1 Desktop Review Methods

Prior to the field assessment, a desktop review was undertaken to identify Threatened and Priority Flora and Ecological Communities previously recorded within the survey area and surrounds. The review involved:

- Review of findings from previous studies within or near the project area
- Review relevant existing literature as available
- Search Threatened and Priority Flora and Communities databases including;
  - DBCA Naturemap database (10km and 20km radius)
  - Commonwealth (EPBC Act) Protected Matters Database (PMST) (10km and 20km radius)
  - DBCA Threatened and Priority Flora (TPFL) Databases (custom database search request, 90km radius)
  - Western Australian Herbarium Specimen (WA Herb) database (custom database search request, 90km radius)
  - DBCA TEC Database (custom database search request, 50km radius)
- Analysis of aerial imagery, broadscale vegetation mapping data, and vegetation and landscape feature spatial data to identify expected vegetation assemblages and significant landscape features.

4.2 Field Survey Strategy

The Targeted Flora and Vegetation field survey was conducted between the 16th and 20th of November 2020 by Principal Ecologist / Botanist Joseph Grehan and Senior Ecologist Heather Legge of Terratree.

The survey area was extensively travelled by vehicle and foot to verify and define vegetation communities and to search for Threatened or Priority flora identified as potentially occurring within the survey area during the desktop review. Relevés and opportunistic sampling were conducted to delineate vegetation communities and search for Targeted species.

Where species could not be identified in the field, they were collected, labelled, pressed, dried and frozen in accordance with the requirements of the WA Herbarium. Subsequently, their identification was confirmed by

Senior Botanist-Taxonomist, Kathya Tippur, by comparing collections with pressed specimens housed at the herbarium and using taxonomic keys and other reference materials.

In some cases, collected specimens can only be identified to the genus level. For example, when they are sterile at the time of the survey, they may lack distinguishing features, such as flower or fruits, necessary for species-level identification. Any specimens that could only be identified to genus level were reviewed to see whether they were from genera listed in the Targeted species list. In cases where they were of Targeted genera, in the first instance, an attempt was made by the botanist to rule out the Targeted species. If this was not possible, an assessment was undertaken to determine the likelihood of these Threatened and Priority species occurring within the survey area. The assessment involved consideration of habitat, including soil types, landscape position and associated vegetation communities of the species in question, along with a review of the recorded distribution of these species around the survey area using the custom search of DBCA WA Herbarium and TPFL Databases (DBCA 2020c, DBCA 2020d). This data provides useful information on the expected habitat and associated vegetation of Priority species if they were to occur within the survey area.

Survey Limitations are discussed in **Section 5.6**.

4.3 Relevés and Opportunistic Sampling

A total of 21 relevés were sampled, representing a minimum of three and up to five relevés in each vegetation community, except for Community 7, which had a very limited distribution. A significant proportion of the survey area was visually assessed on foot and vehicle and opportunistic sampling. Field data was collected using hand-held GPS units (GDA 94).

Relevé locations were selected using aerial photography, topographic features, and field observations to represent vegetation diversity. Standardised data collection sheets were used to ensure consistent data records for the following features in each relevé:

- Observer
- Date
- Location/site
- GPS Location (GDA 94)
- Species observed
- Soil type and colour
- Topography
- Degree and nature of disturbances

4.4 Determining Vegetation Communities

Vegetation communities encountered within the survey area are described using the National Vegetation Information System (NVIS) structural formation terminology in accordance with the Australian vegetation Attribute Manual (NVIS TWG 2017). The terminology table adapted from the manual is provided in **Appendix D**. The NVIS structural formations are standardised terminology integrating and growth form, height and cover within each stratum. The dominant species are included in the description of each stratum to produce detailed and practical vegetation descriptions. In conjunction with edaphic and landscape features, the dominant species in each stratum are used to identify distinct floristic communities.

4.5 Assessing Vegetation Condition

The Keighery vegetation disturbance scale was used to determine the condition of vegetated areas within the project area. This scale is outlined in **Table 5**.

Table 5: Keighery vegetation disturbance scale (Keighery 1994, Adapted from EPA 2016b)

Scale		Condition
1	Pristine	Pristine or nearly so, no obvious signs of disturbance.
2	Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
3	Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
4	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 grazing.
5	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 grazing.
6	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.

4.6 Mapping

Vegetation community areas and condition were digitised using QGIS 3.10 (QGIS Development team 2021), by digitising vector polygons over a high-resolution aerial photography layer (**Figure 2**, **Figure 3**).

Vegetation mapping delineates plant communities and condition in accordance with **Table 5** and **Table 10**. A combination of aerial photography and ground-truthing was used to interpret the vegetation patterns present in the survey area.

5 Results

5.1 Desktop Review Results

5.1.1 Previous Studies

The findings of previous surveys conducted within the project area and general surrounds were reviewed. Relevant reports are listed in **Table 6**. The van Ettan (2009) report was the most recent and applicable. None of these surveys recorded any Threatened or Priority Flora or Ecological Communities as being present within their respective survey areas.

Minesite Rehabilitation Services Pty Ltd (1995) noted a small presence of *Lycium ferocissimum* (African Boxthorn), which is a WONS.

Table 6: Previous environmental surveys within or near the survey area

Author	Year	Reference
Dr Eddie van Etten	2009	*Flora and Vegetation of Focus Minerals Limited's Open Pits Project Area, Coolgardie, Western Australia*. Unpublished Report Prepared for Minesite Environmental Pty Ltd, Kalgoorlie.
Woodman Environmental Consulting Pty Ltd	2002	*Flora and vegetation Survey, Three-mile Hill In-Pit Tailings Storage Facility Surrounds.* Unpublished Report Prepared for Coolgardie Mining Company Pty Ltd.
Minesite Rehabilitation Services Pty Ltd	1995	*Biological Study and Rehabilitation Schedule for Notice of Intent, Brilliant/North Open Pit Project.* Unpublished report Prepared for Goldfan Limited Coolgardie Operations.

5.1.2 Threatened and Priority Flora

The database search using NatureMap and EPBC Protected Matters Search Tool (PMST) for Threatened and Priority flora (TPFL) records showed a total of 24 flora records within 20km from the search area. TPFL within 20km consisted of one Threatened, ten Priority 1, four Priority 2 and seven Priority 3 and two Priority 4 flora species. Thirteen of these occur within 10km (DAWE 2020, DBCA2020b). **Table 7** lists the Threatened and Priority flora species recorded within the 20km radius search area in the NatureMap and EPBC Protected Matters database and specifies those which occur within 10km. **Appendix B** presents the 20km NatureMap search report in full, and the full EPBC Protected Matters Database search results are presented in **Appendix C**. The DBCA WA Herbarium and TPFL Databases custom search showed no records within the survey area but several very nearby (DBCA 2020c, DBCA 2020d). This data provides useful information on the expected habitat and associated vegetation of Priority species potentially occurring within the survey area.

Table 7 : Threatened and Priority flora recorded within 20km radius of survey area (DAWE 2020, DBCA 2020)

Taxon Name and Conservation Status		DBCA	EBPC	<10km
THREATENED	*Gastrolobium graniticum*	T	EN	◆
PRIORITY 1	*Acacia coatesii Maslin*			◆
	Acacia sclerophylla var. *teretiuscula*			
	Acacia websteri			◆
	Austrostipa sp. *Carlingup Road*			
	Dampiera plumosa			◆
	Eucalyptus websteriana subsp. *norsemanica*			
	Lepidosperma sp. *Parker Range*			
	Phebalium appressum			
	Thryptomene sp. *Coolgardie*			◆
	Thryptomene planiflora Rye			◆
PRIORITY 2	*Austrostipa* sp. *Dowerin*			◆
	Hakea rigida			
	Lepidium merrallii			◆
	Phebalium clavatum			
PRIORITY 3	*Allocasuarina eriochlamys* subsp. *grossa*			
	Austrostipa blackii			◆
	Chrysocephalum apiculatum subsp. *norsemanense*			◆
	Eremophila veronica			◆
	Grevillea georgeana			◆
	Notisia intonsa			
	Phlegmatospermum eremaeum			◆
PRIORITY 4	*Eremophila caerulea* subsp. *merrallii*			
	Eucalyptus jutsonii Maiden subsp. *jutsonii*			

(VU: Vulnerable, EN: Endangered, CR: Critically Endangered)

5.1.3 Threatened and Priority Ecological Communities

There are no Threatened or Priority Ecological Communities (TECs or PECs) in, or within 20km of the survey area (DAWE 2020). The DBCA TEC database custom search revealed no TECs within 50km of survey area (DBCA 2020e).

5.1.4 Environmentally Sensitive Areas

The PMST searches revealed no ESAs within 20km of the survey area (DAWE 2020).

5.1.5 Introduced Flora

The PMST search revealed two WONS, *Carrichtera annua* (Ward's Weed) and *Cylindropuntia* spp. (Prickly Pears) occurring within 10 km of the survey area (DAWE 2020). Specifically, the NatureMap Search recorded *Cylindropuntia tunicata* (Hudson Pear) (WONS) (DBCA 2020b).

Minesite Rehabilitation Services Pty Ltd (1995) noted a small presence of WONS, *Lycium ferocissimum* (African Boxthorn).

The NatureMap search found the 27 other introduced flora recorded within 10km of the survey area (DBCA 2020b). Three environmental weeds, *Cenchrus ciliaris* (Buffel Grass), *Eragrostis curvula* (African Lovegrass) and *Rumex vesicarius* (Ruby Dock) were listed.

Introduced flora within 20km of the survey area recorded during the desktop assessment is listed in **Table 8**. The full NatureMap and PMST search report is provided in **Appendix B** and **Appendix C**.

Table 8: Introduced flora recorded within 20km radius of survey area

Species	Status	Source		
		DBCA (NatureMap Distance)	EPBC (PMST)	Previous Surveys*
Lycium ferocissimum (African Boxthorn)	WONS	<10km		◆
Carrichtera annua (Ward's Weed)	WONS	<10km	◆	
Cylindropuntia spp. (Prickly Pears)	WONS	10-20km	◆	
Acacia pycnantha (Golden Wattle)		<10km		
Brassica tournefortii (Mediterranean Turnip)		10-20km		
Cenchrus ciliaris (Buffel Grass)	Environmental weed	10-20km		
Conyza bonariensis (Flaxleaf Fleabane)		<10km		
Conyza sumatrensis		<10km		
Cylindropuntia tunicata	WONS	<10km		
Eragrostis curvula (African Lovegrass)	Environmental weed	<10km		
Glandularia aristigera		<10km		
Helianthus annuus (Sunflower, Common Sunflower)		<10km		
Heliotropium europaeum (Common Heliotrope)		<10km		
Limonium sinuatum (Perennial Sea Lavender)		<10km		
Lythrum hyssopifolia (Lesser Loosestrife)		<10km		
Malva parviflora (Marshmallow)		10-20km		
Marrubium vulgare (Horehound)		10-20km		
Medicago minima (Small Burr Medic)		<10km		
Monoculus monstrosus		10-20km		
Opuntia elata	WONS	<10km		
Papaver hybridum (Rough Poppy)		<10km		
Pentameris airoides subsp. airoides		<10km		
Phalaris paradoxa (Paradoxa Grass)		<10km		
Rumex vesicarius (Ruby Dock)	Environmental weed	<10km		
Salvia reflexa (Mintweed)		<10km		
Salvia verbenaca (Wild Sage)		<10km		
Schinus molle var. *areira*		<10km		
*Sisymbrium orientale (*Indian Hedge Mustard*)*		<10km		
Spergularia diandra (Lesser Sand Spurry)		<10km		
Urochloa panicoides		<10km		
Vicia monantha subsp. *trifloral*		<10km		

*Minesite Rehabilitation Services Pty Ltd (1995)

5.2 Field Survey Results

5.2.1 Flora

A total of 95 species of flora from 28 families were recorded within the survey area. The most common families were Scrophulariaceae, of which most were *Eremophila* spp., Chenopodiaceae, of which most were *Maireana* spp. and Myrtaceae, of which most were *Eucalyptus* spp. and some *Melaleuca* spp. Two other common families were Fabaceae (mostly *Acacia* spp.) and Poaceae (grasses). Eremophila was the most diverse and common genus, occurring in all communities and with eleven species confirmed. Acacia and Eucalyptus were the next most diverse and common genera, both occurring in six of the communities with eight confirmed species. The most widespread species were *Atriplex nummularia* (Old-man saltbush), *Atriplex vesicaria* (Bladder saltbush), *Olearia muelleri* (Goldfields daisy) and *Scaevola spinescens* (Currant bush) which were present in all seven vegetation communities. *Cratystylis conocephala* (Greybush), *Dodonaea lobulata* (Bead Hopbush), *Maireana triptera* (Threewinged Bluebush) and *Senna artemisioides* subsp. *filifolia* were the next most common and widespread, with each being found in five communities.

Five introduced species were recorded, including two WONS. A complete list of all recorded flora is included in **Appendix E**.

5.2.2 Confirmed Threatened and Priority Flora (species recorded)

No Threatened Flora were recorded.

One Priority species, *Acacia websteri* (P1), was recorded in community 4 in relevé C3R4, which is on the western edge of the survey area, near Nepean Rd. *Acacia websteri* (P1) was not identified until after the survey, so its exact extent and location was not recorded. The relevé where this species was recorded is shown in (**Figure 2a** and **2b**).

Acacia websteri (P1) is a shrub with yellow flowers and fibrous bark growing 1.2 to 5m in red sand, loam or clay in low-lying areas and flats (WA Herbarium 2021). Photos of examples of *Acacia websteri* (P1) are included in **Photo 1**.

5.2.3 Potential Threatened and Priority Flora (Targeted Genus Recorded, Species Unconfirmed)

Nine specimens collected could not be identified to species level because they were sterile at the time of survey. Of these, four specimens were from genera of seven Targeted species listed in the desktop review (**Table 7**). For these genera, an assessment of the likelihood' of these Targeted flora occurring within the survey area was conducted. This assessment is included in **Appendix F** and summarised in **Table 9**. Only one species, *Eremophila veronica* (P3), is considered Very Likely to occur within the survey area, and one other species, *Austrostipa blackii* (P2), is considered Likely. All five of the others are considered Unlikely to occur within the survey area, and therefore it is unlikely that the specimens collected are these species.

Although the specimens were sterile any identifying features present were closely examined and compared with all Targeted species, particularly those which were considered Very Likely to occur in the assessment area. Examination of the collected specimens compared with the Targeted species determined that it is unlikely any of the collected specimens are targeted species. *Eremophila veronica* (P3) can be ruled out entirely due to its distinctive foliage. *Austrostipa blackii* (P2) could not be ruled out, however, it is not considered very likely that any of these specimens are Targeted species.

Table 9: Summary of Likelihood assessment of the occurrence of Priority Flora collected of Targeted genera

Collection Name and ID	Potential Priority Species	Conservation Status	Likelihood Occurrence in Survey Area
Austrostipa sp. (CS84)	*Austrostipa blackii*	Priority 2	Likely
	Austrostipa sp. *Carlingup Road*	Priority 1	Unlikely
	Austrostipa sp. *Dowerin*	Priority 2	Unlikely
Eremophila spp. (CS10, CS32)	*Eremophila caerulea* subsp. *merrallii*	Priority 4	Unlikely
	Eremophila veronica	Priority 3	Very Likely
Phebalium sp. (CS68)	*Phebalium appressum*	Priority 1	Unlikely
	Phebalium clavatum	Priority 3	Unlikely

5.3 Vegetation Communities

The survey area is dominated by Eucalypt Mallee Woodlands and Open Woodlands with small areas of Mallee Shrublands and one Isolated Eremophila Heathland. Seven distinct communities were observed within the survey area. Communities 1 to 7 are summarised in **Table 10** and described in detail in **Appendix G** (**Tables G.1 – G.7** respectively), including photo examples for each community. No Threatened or Priority Ecological Communities (TECs or PECs) and No Environmentally Sensitive Areas (ESAs) were observed within the survey area.

Vegetation communities are indicatively mapped using a combination of field data, aerial imagery and spatial data such as contours and geology to define their boundaries in **Figure 2** (**Figures 2a**, **2b**, and **2c**). Vegetation communities were primarily distinguished from one another by dominant upper strata species (See **Section 4.4**). The dominant upper stratum species were determined by subtle changes in soil surface characteristics creating a complex mosaic. Trends in vegetation communities are observable based on landscape position and soil type, with an ecotone or transitional area between communities. Vegetation community mapping in **Figure 2a**, **2b**, and **2c** represents the most common vegetation community in each landscape position at a broader scale, and the boundaries represent the approximate mid-point of an ecotone between communities.

Covering the largest area of 173ha (19.6% of the total survey area), Community 6, *E. salmonophloia* (Salmon gum) Open Woodland over chenopod understory occupies deep flat soils. Moving up through the landscape, the second most common community, Community 5, *E. Campaspe* Mallee Woodlands occupies 128ha (14.5%) on lower slopes of greenstone rises, and some stony drainage lines, where chenopods again dominate lower the stratum. Further up the landscape, Community 2 *Eucalyptus clelandiorum* (Cleland's Blackbutt) Mallee Woodlands is found on 73.5ha (8.3%) of greenstone mid-slopes. Mallee woodlands of Community 1 *Eucalyptus griffithsii* and *E. torquata* occupy 102ha (11.5%) on shallow stony upper slopes, interspersed with drainage lines of Community 3 *Eucalyptus griffithsii* Mallee Woodland, which lacks *E. torquata* and occupies approximately 66ha (7.4%). Community 4, *Acacia* spp. and *Allocasuarina* spp. Mallee Shrublands occupy two pockets of lateritic ridges totalling 6.9ha (0.8%). Finally, one small ironstone mesa of 0.6ha (0.1%) contains Community 7, *Eremophila oppositifolia* Isolated Heathland.

Approximately 335ha (37.8%) was in Degraded or Completely Degraded vegetation condition and were not mapped due to the absence of the vegetation structure necessary to adequately describe the vegetation community that would ordinarily have been present (**Figure 2**, **Figure 3**).

Table 10: Summary of Vegetation Communities in the survey area

ID	Community Name	Structure Summary	Landscape Position	Area (Ha)	Percent of Survey area (%)
C1	*Eucalyptus griffithsii* with *E.torquata*	Mallee woodland	Shallow stony soils, upper slopes	102.1	11.5
C2	*Eucalyptus clelandiorum* (Cleland's Blackbutt)	Mallee Woodland	Greenstone midslopes	73.5	8.3
C3	*Eucalyptus griffithsii* (*E. torquata* absent)	Mallee Woodland	Drainage lines	65.8	7.4
C4	*Acacia* spp. and *Allocasuarina* spp.	Mallee Shrubland	Laterite	6.9	0.8
C5	*E. campaspe* (Silver-topped gimlet)	Mallee Woodland	Greenstone midslopes, occasionally drainage areas	128.2	14.5
C6	*E. salmonophloia* (Salmon gum)	Open Woodland	Flats, low lying deep soils	173.0	19.6
C7	*Eremophila oppositifolia* (Mesa)	Isolated Heathland	Small ironstone mesa	0.6	0.1
Degraded	N/A	N/A	N/A	334.8	37.8
			Total	**884.9**	**100**

5.4 Vegetation Condition

A large portion, 340.7ha (38.5%), of the survey area, was Degraded to Completely Degraded. These areas have been heavily modified by historic and current mining and exploration activities and lack vegetation structure and species diversity (**Photo 2; Photo 3**). Some degraded areas contain attempted rehabilitation and are dominated by chenopods such as *Atriplex nummularia*, *Maireana* spp. and introduced species (**Photo 4**).

Despite large areas of disturbance, 325.6ha (36.9%) remain in Good condition (**Photo 5**) and 217.7ha (24.6%) remain in Very Good condition (**Photo 6**). All relevés were recorded in Good to Very Good Condition so that accurate spices richness could be observed.

The areas and percentages of different vegetation condition categories for the survey area are presented in **Table 11**. Vegetation condition is represented spatially in **Figure 3** (**3a**, **3b**, **3c** and **3d**). Like vegetation communities, the vegetation condition is a mosaic and therefore, figures are indicative only and present the dominant vegetation condition in each area.

Table 11: Area statement of vegetation condition ratings in survey area

Condition Rating	Area (Ha)	Percent (%)
Very Good	217.7	24.6
Good	326.6	36.9
Degraded-Completely Degraded	340.7	38.5
Total	**885**	**100**

5.5 Introduced Flora

Five introduced flora species were recorded. These include two Weeds of National Significance (WONS), *Lycium ferocissimum* (African Boxthorn) and *Opuntia stricta* (Prickly Pear) (Weeds Australia 2021), which is also categorised as a Declared Pest s22(2) (C3 Restricted) in WA under the *BAM Act* (DPIRD 2021) (**Table 1, Table 2**) (**Photo 7**)**.** Control measures must be implemented by land managers in areas infested with Declared plants in the C3 category (DPIRD 2019a).

The other weeds recorded were *Agave americana* (Century plant/Agave/Yucca) which is occasionally naturalised around old habitations and roadsides (WA Herbarium 2021) and along with *Asphodelus fistulosus* (Onion weed) and *Schinus mole* (Peppertree) is categorised as Permitted (s11) under the *BAM Act* (2007) (DPIRD 2021) (**Table 1**). Control measures are not mandated for plants categorised as Permitted (s11) (DPIRD 2021).

Introduced flora recorded during the survey, along with their weed status and management category, is summarised in **Table 12**.

Table 12: Summary of introduced flora recorded in the survey area and their status

Species		Status		
Scientific Name	**Common name**	**WAOL (2021)**	**Weeds Australia (2021)**	**WA Herbarium (2021)**
Agave americana	Century plant/Agave/Yucca	Permitted (s11)		Occasionally Naturalised
Asphodelus fistulosus	Onion weed	Permitted (s11)		
Lycium ferocissimum	African Boxthorn	Permitted (s11)	WONS	
Opuntia stricta	Common Prickly Pear	Declared Pest (s22(2) (C3 Restricted)	WONS	
Schinus mole	Peppertree	Permitted (s11)		

5.5.1 *Lycium ferocissimum* (African Boxthorn) (WONS)

Several individuals of *Lycium ferocissimum* were recorded dispersed widely throughout the 'mid' and 'south' sections of the survey area (**Photo 7**).

Lycium ferocissimum is a quickly spreading, large spiny shrub that grows to 5m tall and wide (Weeds Australia 2020a). It can quickly establish impenetrable spiny thickets, which harbour pests, and prevent land access and over-run native species (Weeds Australia 2021a).

5.5.2 *Opuntia stricta* (Common Prickly Pear) (WONS and Declared Pest)

One individual *Opuntia stricta* (Common Prickly Pear) was recorded in the north of the 'mid' section of the survey area. Example photo of this species are included in (**Photo 8**).

Opuntia stricta is an erect spreading shrub usually growing to 0.5 to 1m and up to 2m tall, and up to 5m wide (Weeds Australia 2021b). It an aggressive, drought tolerant weeds that spreads by seeds and segment fragments and can form dense impenetrable infestations which take over natural areas and pastoral lands, harbour pests and cause injury to people and animals (Weeds Australia 2021b). *Opuntia stricta* was once a catastrophic weed of parts of Queensland and New South Wales until the introduction of the cactoblastis moth as biological control (Weeds Australia 2021b).

5.6 Survey Limitations

The potential limitations of the survey, as outlined in the EPA Guidance (EPA 2016b) are listed and their impacts discussed in **Table 13**.

Table 13: Discussion of potential limitations to the survey (adapted from EPA 2016b)

1. Availability of contextual information at a regional and local scale
Not a Limitation - There was adequate local and regional background information to inform the Desktop study of the survey area.
2. Competency and experience of the team carrying out the survey, including experience in the bioregion surveyed
Not a Limitation - The field survey was carried out by suitably qualified and experienced Ecologists with substantial botanical surveying within the region, and subsequent plant identification undertaken conducted by Taxonomist Kathya Tippur (MSc. Botany) who has extensive experience as in Botany-Taxonomy throughout Western Australia.
3. Proportion of flora recorded and/or collected, any identification issues or taxonomic uncertainty
Partial Limitation - The survey and relevés were undertaken in accordance with EPA Guidance (2016b) and plant specimens collected when botanists were not able to identify plants in the field. Opportunistic sampling was undertaken between relevés to ensure the survey area was adequately sampled. Because *Acacia websteri* (P1) was identified after the field survey, the exact location and number of individuals in this population not recorded. Nine of the 100 collected specimens could only be identified to genus level. In cases when these specimens were from genus that were in the Targeted list of TPFL species (i.e. *Eremophila* sp., *Austrostipa* sp. *Phebalium* sp.) initially an attempt was made to rule out the Targeted species. If this was not possible, an assessment was undertaken to determine the likelihood of the TPFL species to occur within the survey area.
4. Survey Effort and Extent
Possible Limitation - The total survey area was 885ha and the total area in at least Good condition was 544.3ha, so it was not possible to cover the entire area in great detail. However, the intensity of the survey was adequate. Twenty-one relevés were undertaken over 5 days, and by the end of the survey no new vegetation types and few new plant species were being encountered.
5. Access restrictions within the survey area
Not a Limitation - Access to the survey site was not inhibited, all necessary parts of the survey areas could be accessed by vehicle or on foot.
6. Survey timing, rainfall, season of survey
Limitation - The EPA Guidance (2016b) recommends the Interzone be surveyed September -November with supplementary surveys after autumn rains and the survey was undertaken in November. September 2019 was completely dry, and October was much drier than average. Furthermore, total rainfall in the 12 months preceding the survey was well below average. Therefore, annual species were likely underrepresented, and many perennial species were sterile at the time of survey making identification to species level difficult. Nine of the 100 specimens collected could not be identified beyond genus levels, and of these 4 were from genera on the Targeted flora list, so could not be ruled out as being Priority species in this list. The survey was conducted outside of the recorded flowering timing of some Targeted species

7. Disturbance that may have affected the results of survey (e.g., fire, flood or clearing)
Not a Limitation - A total of 340.7ha of the 885ha was in Degraded to Completely Degraded condition and could not be assessed. Disturbance was not a limitation throughout the rest of the survey area.
8. Other limitations (e.g., Mapping reliability, resources)
Not a Limitation - There were no other survey specific limitations.

6 Discussion

6.1 Flora

A total of 95 species of flora from 28 families were recorded within the survey area. The most common and diverse genus was Eremophila which was recorded in all communities, with eleven species identified. Acacia and Eucalyptus were the next most diverse and common genera, both occurring in six communities with eight confirmed species. The most widespread species were *Atriplex nummularia* (Old-man saltbush), *Atriplex vesicaria* (Bladder saltbush), *Olearia muelleri* (Goldfields daisy) and *Scaevola spinescens* (Currant bush) which were present in every vegetation community. *Cratystylis conocephala* (Greybush), *Dodonaea lobulata* (Bead Hopbush), *Maireana triptera* (Threewinged Bluebush) and *Senna artemisioides* subsp. *filifolia* were the next most common and widespread species. Five introduced species were recorded, including two WONS, of which one is also a Declared pest in WA.

6.1.1 Threatened and Priority Flora

No Threatened Flora species were recorded. One Priority species, *Acacia websteri* (P1), was recorded

***Acacia websteri* (P1)**

Acacia websteri (P1) was collected in Community 4 in C4R2 on the western edge of the survey area, near Nepean Rd. The specimen was identified after the field survey, so the exact location and number of individuals in this population not recorded. A follow-up Targeted survey should be conducted to confirm this. It is possible that this species is present in other parts of the survey area, particularly within Community 4 vegetation, which is an Acacia - Allocasuarina dominated mallee shrubland. Community 4 has a restricted distribution represented in three small areas totaling 6.9ha (0.8%) within the survey area (**Figure 2a**).

Acacia websteri (P1) is known to occur in 50 records in WA in the central southern inland areas from Bencubbin to Coolgardie-Kalgoorlie areas from the (DBCA 2020b). Custom database searches of the DBCA TPFL and WA Herbarium databases revealed four other *Acacia websteri* (P1) populations outside the survey area, nearby, to the west-north-west of where it was recorded in the survey area. The species is found in three populations of 3, 5 and 19 individuals located 250 to 300m from the survey area boundary near where *Acacia websteri* (P1) was recorded (DBCA 2020c; DBCA 2020d). Another population of 35 individuals is recorded 975m away in the same direction (DBCA 20020c). Therefore, it is possible that this species could exist in multiple populations throughout the survey area.

6.1.2 Potential Threatened and Priority Flora (Targeted Genus Recorded, Species Unconfirmed)

Nine specimens collected could not be identified to species level because they were sterile at the survey time. Of these, four specimens were from genera of seven Targeted Priority species listed in the desktop review.

For these genera, an assessment of the likelihood' of these Targeted flora occurring within the survey area was conducted (**Appendix F**), which found only one species, *Eremophila veronica* (P3), to be Very Likely, and one other species, *Austrostipa blackii* (P2), Likely to occur within the survey area (**Table 7**). All five of the others are considered Unlikely to occur within the survey area, and therefore it is unlikely that the specimens collected are these species. Furthermore, identifying features present were closely examined and compared with Targeted species, particularly those which were considered Very likely to occur in the assessment area. It is not considered likely that any of these specimens are Targeted species. *Eremophila veronica* (P3) has distinctive foliage, and the specimen collected during the survey is not consistent with this species. It is not possible to rule out *Austrostipa blackii* (P2) with the sterile specimen collected, and this species may occur in the survey area.

Austrostipa blackii (P2), flowers from September to November (WA Herbarium 2021). This species may be observable in the field while not flowering, however species-level identification will require flowers or fruiting material. The *Austrostipa* sp. specimen was collected from Community 3, associated with drainage lines. Future Spring searches Targeting *Austrostipa blackii* (P2), should be considered if disturbance is planned in drainage line areas associated with Community 3.

6.2 Vegetation Communities

No Threatened or Priority Ecological Communities (TECs or PECs) and No Environmentally Sensitive Areas (ESAs) were observed within the survey area.

The vegetation condition of more than 300ha was found to be Degraded or Completely Degraded and therefore could not be mapped as vegetation communities. The dominant upper stratum species were determined by changes in soil characteristics and landscape position, and communities were highly mosaic. The result of this is a complex mosaic of vegetation communities that can change rapidly over a small area. In particular, Communities 2 and 5, Mallee Woodlands dominated by *Eucalyptus clelandiorum* (Cleland's Blackbutt) and *E. campaspe* (Silver Gimlet), respectively, are strongly associated with one another and highly mosaic. However, vegetation community trends are observable based on landscape position and soil type, with an ecotone or transitional area between communities.

Seven distinct communities were observed within the survey area. The survey area is dominated by Eucalypt Mallee Woodlands and Open Woodlands. Community 4, *Acacia* spp. and *Allocasuarina* spp. Mallee Shrublands occupy two pockets of lateritic ridges totalling 6.9ha (0.8% of the total survey area). One small ironstone mesa of 0.6ha (0.1%) contains Community 7, *Eremophila oppositifolia* Isolated Heathland. Community 6, *E. salmonophloia* (Salmon gum) open woodland is the most widespread, covering 173ha (19.6%), in deeper soils. Community 5, *E. Campaspe* Mallee Woodlands is the second-most widespread, occupying 128ha (14.5%)

on lower slopes of greenstone rises, and some stony drainage lines. Community 1 *Eucalyptus griffithsii* and *E. torquata* occupy 102ha (11.5%) on shallow stony upper slopes. Community 2 *E. clelandiorum* (Cleland's Blackbutt) Mallee Woodland occupies 73.5ha (8.3%) of greenstone midslopes. Community 3 *E. griffithsii* Mallee Woodland lacking *E. torquata* and occupies approximately 66ha (7.4%) in drainage lines.

This vegetation structure and composition is typical of the region and is consistent with the region's subsystem description (described in **Section 3.2**).

6.3 Vegetation Condition

A large portion, 340.7ha (38.5%), of the survey area was Degraded to Completely Degraded. Degraded areas are comprised of areas that have been impacted by mining and exploration activities over long periods of time and now lack healthy vegetation structure and density, as described in **Table 5**. Completely Degraded vegetation was observed in infrastructure areas, such as water holding facilities, roads, and areas that have been completely cleared of vegetation. Despite large areas of disturbance, 325.6ha (36.9%) remain in Good condition, and 217.7 ha (24.6%) remain in Very Good condition. Generally, the Salmon gum communities on the broad valley flats (Community 6) were in poorer condition, and tended to be in Good condition, compared with vegetation higher in the landscape on undulating shallow soils, which tended to be in Very Good condition.

6.4 Introduced Flora

Out of the 95 species recorded, five are introduced species. These include two Weeds of National Significance (WONS), *Lycium ferocissimum* (African Boxthorn) and *Opuntia stricta* (Prickly Pear) (Weeds Australia 2021), which is also categorised as a Declared Pest s22(2) (C3 Restricted) in WA under the *BAM Act* (DPIRD 2021). Control measures must be implemented by land managers in areas infested with Declared plants in the C3 category (DPIRD 2019a). Both these species are highly invasive, and national best practice control manuals have been developed for *Lycium ferocissimum* and invasive *Opuntioid* cacti in Australia.

The other weeds recorded were *Agave americana* (Century plant/Agave/Yucca) which is occasionally naturalised around old habitations and roadsides (WA Herbarium 2021). *Agave americana, a*long with *Asphodelus fistulosus* (Onion weed) and *Schinus mole* (Peppertree), is categorised as Permitted (s11) under the *BAM Act* (2007) (DPIRD 2021). Control measures for species categorised as Permitted (s11) are not mandatory under the *BAM Act* (DPIRD 2021).

6.4.1 *Lycium ferocissimum* (African Boxthorn) (WONS)

*Lycium ferocissimum (*African boxthorn) has been present in small numbers in the area since 1995 (Mine Site Rehabilitation 1995) and several dispersed widely throughout the 'mid' and 'south' sections of the survey area.

Spreading quickly, the large shrub can rapidly establish impenetrable spiny thickets, which harbour pests and prevent land access (Weeds Australia 2021a). Once properly established, it is difficult to eradicate, and prevention is the most cost-effective form of weed control, and early action is crucial to help prevent its spread (Weeds Australia 2021a). Therefore, both physical and chemical control methods should be undertaken early. Any control efforts must be long-term to prevent the re-establishment of populations from existing populations (Weeds Australia 2021a).

6.4.2 *Opuntia stricta* (Common Prickly Pear) (WONS and Declared Pest)

One individual *Opuntia stricta* (Common Prickly Pear) was recorded in the north of the 'mid' section of the survey area. An aggressive, drought-tolerant weed that spreads by seeds and segment fragments, *Opuntia stricta* can form dense impenetrable infestations which take over natural areas and pastoral lands, harbour pests and cause injury to people and animals (Weeds Australia 2021b). *Opuntia stricta* was once a catastrophic weed of parts of Queensland and New South Wales until the introduction of the *Cactoblastis* moth as biological control (Weeds Australia 2021b).

Opuntia stricta (Common Prickly Pear) is classified as a Declared pest s22(2) (C3 Restricted), as described in **Table 2** (DPIRD 2021) and therefore, it is a requirement that control measures be undertaken in the survey area to manage this species.

Although Prickly pears do have a biological control agent, the efficacy of biological control agents is limited in dry climates or on plants growing in poor soils. Physical removal remains the best form of control and herbicide application (Weeds Australia 2021b).

Management requirements for areas infested with Declared pest species in Category 3 (C3) are as follows:

- "The infested area must be managed in such a way that alleviates the impact, reduces the number or distribution or prevents or contains the spread of the declared pest in this area
- Ensure that any person conducting an activity on the land is aware that measures are required to be taken to control the declared pest" (DPIRD 2019a).

DPIRD (2019a) recommends that land managers:

- "Treat to destroy all plants, prevent seed set and prevent the spread of seed or plant parts within and from the area on or vehicles and/or machinery prior to seed set each year
- Erect a biosecurity sign for persons conducting any activity on the land."

7 Conclusions and Recommendations

A total of 95 species of flora from 28 families were recorded within the survey area. No Threatened Flora species were recorded. One Priority species, *Acacia websteri* (P1), was recorded. *Acacia websteri* (P1) was collected in Community 4 in C4R2. The specimen was identified after the field survey, so a follow-up Targeted survey should be conducted, ideally after autumn rains to determine the exact location and extend of this species in C4R2 and throughout Community 4 and in other areas of suitable habitat. Four other populations of *Acacia websteri* (P1) occur nearby, outside the survey area (DBCA 2020c; DBCA 2020d). Therefore, it is possible that this species could exist in multiple populations throughout the survey area. *Acacia websteri* (P1) has distinctive features on the leaves and can be identified by close examination of the leaves, without the need for flowers or fruit. This allows flexibility of timing of the targeted search.

Nine specimens collected could not be identified to species level because they were sterile at the survey time. Of these, four specimens were from genera of seven Targeted Priority species listed in the desktop review. The assessment of the likelihood of these Targeted Priority flora occurring within the survey area found only one species, *Eremophila veronica* (P3), to be Very Likely, and one other species, *Austrostipa blackii* (P2), Likely to occur within the survey area. The collected *Eremophila* sp. specimens are not *Eremophila veronica* (P3), however, the *Austrostipa* sp., specimen, could possibly be *Austrostipa blackii* (P2), although this is not considered likely. Future Spring surveys Targeting *Austrostipa blackii* (P2), should be considered if disturbance is planned in drainage line areas associated with Community 3.

The survey area is dominated by Eucalypt Mallee Woodlands and Open Woodlands with small Mallee Shrublands areas and one Isolated Heathland. Seven distinct communities were observed within the survey area. No Threatened or Priority Ecological Communities (TECs or PECs) and No Environmentally Sensitive Areas (ESAs) were observed within the survey area.

A large portion, 340.7ha (38.5%), of the survey area was Degraded to Completely Degraded. 325.6ha (36.9%) remain in Good condition, and 217.7ha (24.6%) remain in Very Good condition.

Five introduced species were recorded, including two Weed of National Significance (WONS), *Lycium ferocissimum* (African Boxthorn) and *Opuntia stricta* (Common Prickly Pear), which is also a Declared Pest s22(2) (C3 Restricted) (DPIRD 2021). Control measures are required a Declared Pest s22(2) (C3 Restricted) (DPIRD 2019a) and therefore must be implemented for *Opuntia stricta*. Both species are highly invasive, and management actions should be undertaken for both species. National best practice control manuals have been developed for *Lycium ferocissimum* and invasive *Opuntioid* cacti in Australia, and these should be referred to when developing and conducting control measures.

Terratree makes the following recommendations for the survey area:

- Avoid in the first instance, and, if unavoidable minimise and mitigate impacts t *Acacia websteri* (P1) flora and the vegetation communities that this species is associated with (Communities 4) until the species exact location and extent can be determined.
- Follow-up Targeted surveys should be in accordance with EPA Guidance (2016b) in late Autumn to search for *Acacia websteri* (P1) in Community 4.
- Consider a Targeted search for *Austrostipa blackii* (P2) in drainage lines in Community 3, in Spring if disturbance activities are planned in these areas.
- Undertake development activities so as to avoid incidental impacts to vegetation in Good to Very Good Condition wherever possible.
- Develop and implement a hygiene management plan to prevent the introduction and spread of introduced flora and pathogens
- Conduct weed eradication and control measures for WONS and Declared Pest species recorded, *Lycium ferocissimum* (African Boxthorn) (WONS) and *Opuntia stricta* (Common Prickly Pear) (WONS and Declared Pest).

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Photos

Photo 1: ***Acacia websteri*** **(P1) (World Wide Wattle 2020, photographer B.R. Maslin).**

Photo 2: Degraded area showing the impacts of disturbance and loss of vegetation structure and richness.

Photo 3: Examples of various disturbances to vegetation within the survey area.

Photo 4: Rehabilitation area dominated by chenopods such *Atriplex nummularia* and *Maireana* spp. and some introduced flora.

Photo 5: Example of Vegetation in Vegetation in Good Condition taken at C6R1.

Photo 6: Example of Vegetation in Very Good Condition in the survey area, taken at C1R1.

Photo 7: *Lycium ferocissimum* (African Boxthorn) a WONS in a Degraded part of the survey area.

Photo 8: *Opuntinia stricta* (Prickly Pear) was observed during the survey (WA Herbarium 2021).

Figures

Figure 1: Project location map

896000 898000 900000 902000

6572000 6570000 6568000 6566000 6564000

Jaurdi Hills Rd
Coolgardie North Rd
Great Eastern Hwy
Great Eastern Hwy
Lindsays Gold Access Rd
Toorak St
Ford St
COOLGARDIE
Great Eastern Hwy
Gnarlbine Rd
Arizona St
Coolgardie Esperance Hwy
Victoria Rock Rd
Nepean Rd
Ladyloch Rd
Ladyloch Rd
Southern Bypass Rd
Tindals Rd
Victoria Rock Rd
Nepean Rd

896000 898000 900000 902000

Legend

- □□r□□□ □r□□
- Roads
- Towns

Overview

Focus Minerals Coolgardie

Targeted Flora and Vegetation Survey □L□cat□□□

0 1 2 km

N

Datum: GDA 1994
Projection: MGA Zone 51

Scale: 1: 30 000 at A3

Date: 12/02/2021	Prepared: H. Legge	Project No: T20040
Expiry:	Checked: J. Grehan	
Figure 1	Revision:	
	Review:	

Terratree

Figure 2a: Vegetation Communities and Priority Flora within the Survey Area – Overview

NOTE: Terratree Pty Ltd does not guarantee that this figure is without any mistakes and disclaims all liability for any error, loss or other consequence that may arise from any of the spatial information illustrated.
Spatial information in this figure is based on observable vegetation made during the field survey component of the assessment.

898000 900000 902000 904000

6572000 6570000 6568000 6566000 6564000

896000 898000 900000 902000

Legend

□□r□□□Area

Prior□ty Flora

◆ *Acacia websteri* (P1)

Vegetation Communities

- C1 - *Eucalyptus griffithsii, E. torquata*
- C2 - *E. clelandiorum* (Cleland's Blackbutt)
- C3 - *E. griffithsii (E. torquata* absent)
- C4 - *Acacia* spp. and *Allocasuarina* spp.
- C5 - *E. campaspe* (Silver Gimlet)
- C6 - *E. salmonphloia* (Salmon gum)
- C□ □*Eremophila oppositifolia* (M□□□)
- D - Degraded

Focus Minerals Coolgardie Flora Survey

Vegetation Communities & Priority Flora - □verview

0 1 2 km

N

Datum: GDA 1994
Projection: MGA Zone 50

Scale: 1: 29 000 at A3

Date: 12/04/2021	Prepared: H. Legge	Project No: T20040
Expiry:	Checked: J. Grehan	
Figure 2a	Revision:	
	Review:	

Terratree

Figure 2b: Vegetation communities and Priority flora within the survey area – South

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Spatial information in this figure is based on observable vegetation made during the field survey component of the assessment.

325000 326000 327000 328000

6573000 6572000 6571000 6570000 6569000

Overview

Legend

Assessment Area

Priority Flora

- *Acacia websteri* (P1)

Vegetation Communities

- C1 - *Eucalyptus griffithsii, E. torquata*
- C2 - *E. clelandiorum* (Cleland's Blackbutt)
- C3 - E. gr□ffithsii (*E. torquata* absent)
- C4 - *Acacia* spp. and *Allocasuarina* spp.
- C5 - *E. campaspe* (Silver Gimlet)
- C6 - *E. salmonphloia* (Salmon gum)
- C7 - *Eremophila oppositifolia* (M□□□)
- D - Degraded

Focus Minerals Coolgardie Flora Survey

Vegetation Communities & Priority Flora - South

0 1 km

N

Datum: GDA 1994
Projection: MGA Zone 51

Scale: 1: 15 000 at A3

Date: 12/04/2021	Prepared: H. Legge	Project No: T20040
Expiry:	Checked: J. Grehan	
Figure 2b	Revision:	
	Review:	

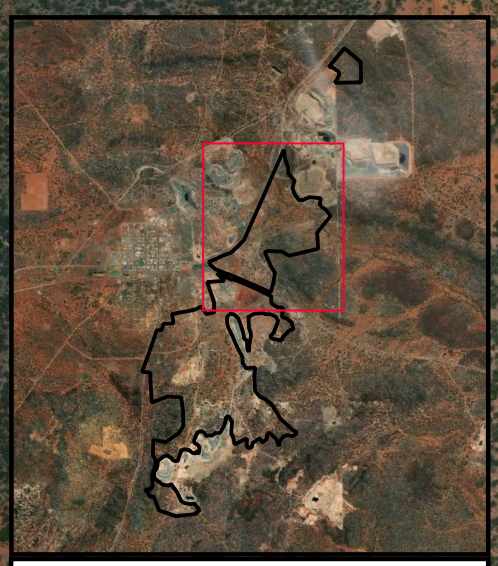
Terratree

Figure 2c: Vegetation communities and Priority flora within the survey area – Mid

NOTE: Terratree Pty Ltd does not guarantee that this figure is without any mistakes and disclaims all liability for any error, loss or other consequence that may arise from any of the spatial information illustrated.
Spatial information in this figure is based on observable vegetation made during the field survey component of the assessment.

326000 326500 327000 327500 328000

6576000 6575500 6575000 6574500 6574000 6573500



Legend

□□r□□□Area

Vegetation Communities

- C1 - *Eucalyptus griffithsii, E. torquata*
- C3 - *E. griffithsii* (*E. torquata* absent)
- C4 - *Acacia* spp. and *Allocasuarina* spp.
- C5 - *E. campaspe* (Silver Gimlet)
- C6 - *E. salmonphloia* (Salmon gum)
- D - Degraded

Focus Minerals Coolgardie Flora Survey

Vegetation Communities - Mid

0 0.5 km

N

Datum: GDA 1994
Projection: MGA Zone 51

Scale: 1: 10 000 at A3

Date: 12/04/2021	Prepared: H. Legge	Project No: T20040
Expiry:	Checked: J. Grehan	
Figure 2c	Revision:	Terratree
	Review:	

Figure 2d: Vegetation communities within the survey area – North

NOTE: Terratree Pty Ltd does not guarantee that this figure is without any mistakes and disclaims all liability for any error, loss or other consequence that may arise from any of the spatial information illustrated.
Spatial information in this figure is based on observable vegetation made during the field survey component of the assessment.

328000 328200 328400 328600 328800 329000

6578400 6578200 6578000 6577800 6577600 6577400 6577200

Legend

Area

Vegetation Communities

- C1 - *Eucalyptus griffithsii, E. torquata*
- C2 - *E. clelandiorum* (Cleland's Blackbutt)
- C3 - *E. griffithsii* (*E. torquata* absent)

Focus Minerals Coolgardie Flora Survey

Vegetation Communities - North

0 100 200 m

N

Datum: GDA 1994
Projection: MGA Zone 51

Scale: 1: 4 000 at A3

Date: 12/02/2021	Prepared: H. Legge	Project No: T20040
Expiry:	Checked: J. Grehan	
Figure 2d	Revision:	
	Review:	

Terratree

Figure 3a: Vegetation Condition – Overview

NOTE: Terratree Pty Ltd does not guarantee that this figure is without any mistakes and disclaims all liability for any error, loss or other consequence that may arise from any of the spatial information illustrated.
Spatial information in this figure is based on observable vegetation made during the field survey component of the assessment.

898000 900000 902000 904000

6572000 6570000 6568000 6566000 6564000

896000 898000 900000 902000

Legend

□□r□□□ □r□□

Vegetation Condition

- Very Good
- Good
- Degraded-Completely Degraded

Focus Minerals Coolgardie Flora Survey

Vegetation Conditon - overview

0 1 2 km

N

Datum: GDA 1994
Projection: MGA Zone 50

Scale: 1: 29 000 at A3

Date: 22/02/2021	Prepared: H. Legge	Project No: T20040
Expiry:	Checked: J. Grehan	
Figure 3a	Revision:	
	Review:	

Terratree

Figure 3b: Vegetation Condition – South

NOTE: Terratree Pty Ltd does not guarantee that this figure is without any mistakes and disclaims all liability for any error, loss or other consequence that may arise from any of the spatial information illustrated.
Spatial information in this figure is based on observable vegetation made during the field survey component of the assessment.

325000 326000 327000 328000

6573000 6572000 6571000 6570000 6569000

Overview

Legend

□□r□□□Area

Vegetation Condition

- Degraded-Completely Degraded
- Good
- Very Good

Focus Minerals Coolgardie Flora Survey

Vegetation Condition - south

0 1 km

N

Datum: GDA 1994
Projection: MGA Zone 51

Scale: 1: 15 000 at A3

Date: 22/02/2021	Prepared: H. Legge	Project No: T20040
Expiry:	Checked: J. Grehan	
Figure 3b	Revision:	
	Review:	

Terratree

Figure 3c: Vegetation Condition – Mid

NOTE: Terratree Pty Ltd does not guarantee that this figure is without any mistakes and disclaims all liability for any error, loss or other consequence that may arise from any of the spatial information illustrated.
Spatial information in this figure is based on observable vegetation made during the field survey component of the assessment.

326000 326500 327000 327500 328000

6576000 6575500 6575000 6574500 6574000 6573500

Legend

□□r□□□Area

Vegetation Condition

- Degraded-Completely Degraded
- Good
- Very Good

Focus Minerals Coolgardie Flora Survey

Vegetation Condition - Mid

0 0.5 km

N

Datum: GDA 1994
Projection: MGA Zone 51

Scale: 1: 10 000 at A3

Date: 22/02/2021	Prepared: H. Legge	Project No: T20040
Expiry:	Checked: J. Grehan	
Figure 3c	Revision:	
	Review:	

Terratree

Figure 3d: Vegetation Condition – North

NOTE: Terratree Pty Ltd does not guarantee that this figure is without any mistakes and disclaims all liability for any error, loss or other consequence that may arise from any of the spatial information illustrated.
Spatial information in this figure is based on observable vegetation made during the field survey component of the assessment.

328000 328200 328400 328600 328800 329000

6578400 6578200 6578000 6577800 6577600 6577400 6577200

Legend

□□r□□□Area

Vegetation Condition

Very Good

Focus Minerals Coolgardie Flora Survey

Vegetation Condition - North

0 100 200 m

N

Datum: GDA 1994
Projection: MGA Zone 51

Scale: 1: 4 000 at A3

Date: 22/02/2021	Prepared: H. Legge	Project No: T20040
Expiry:	Checked: J. Grehan	
Figure 3d	Revision:	
	Review:	

Terratree

Appendices

Appendix A: Conservation Codes under WA and Commonwealth Legislation

Table A.1: Conservation Codes for Western Australia Flora and Fauna (DBCA 2019)

Category	Code	Definition
Threatened Species	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.
	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	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

Category	Code	Definition
		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.
Priority Species	Priority 1: 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.
	Priority 2: 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.
	Priority 3: 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.
	Priority 4: 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.

Table A.2: Conservation Codes for Western Australia Ecological Communities (DEC 2013)

Code	Definition
PD: Presumed Totally Destroyed	An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future. An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant and either of the following applies): A) Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats or B) All occurrences recorded within the last 50 years have since been destroyed.
CR: Critically Endangered	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated. An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria: A) The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply: i) geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years); ii) modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated. B) Current distribution is limited, and one or more of the following apply: i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years); ii) there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes; iii) there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes. C) The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).
EN: Endangered	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future. An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria: A) The geographic range, and/or total area occupied, and/or number of discrete occurrences

Code	Definition
	have been reduced by at least 70% since European settlement and either or both of the following apply: i) the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years); ii) modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated. B) Current distribution is limited, and one or more of the following apply): i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years); ii) there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes; iii) there may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes. C) The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).
VU: Vulnerable	An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range. An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium (within approximately 50 years) to long-term future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria: A) The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated. B) The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations. C) The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long-term future because of existing or impending threatening processes.
Priority One: Poorly-known ecological communities	Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤ 100ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
Priority Two: Poorly-known ecological communities	Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
Priority Three: Poorly known ecological	(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:

Code	Definition
communities	(ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or; (iii) communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc. Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.
Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list.	These communities require regular monitoring. (i) Rare. Ecological communities known from few occurrences 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 communities are usually represented on conservation lands. (ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category. (iii) Ecological communities that have been removed from the list of threatened communities during the past five years.
Priority Five: Conservation Dependent ecological communities	Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Table A.3: Conservation Codes for Threatened Species under the Commonwealth *EPBC Act*

Code	Definition
Ex: Extinct	A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
ExW: Extinct in the Wild	A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time: (a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or (b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
CE: Critically Endangered	A native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
E: Endangered	A native species is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
V: Vulnerable	A native species is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

Code	Definition
CD: Conservation Dependent	A native species is eligible to be included in the conservation dependent category at a particular time if, at that time: (a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or (b) the following subparagraphs are satisfied: (i) the species is a species of fish; (ii) the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised; (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory; (iv) cessation of the plan of management would adversely affect the conservation status of the species.

Table A.4: Conservation Codes for Threatened Ecological Communities under the Commonwealth *EPBC Act*

Code	Definition
CE: Critically Endangered	An ecological community is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
E: Endangered	An ecological community is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
V: Vulnerable	An ecological community is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered nor endangered; and (b) it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

Appendix B: Complete NatureMap Search Results

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report_Coolgardie20km

Created By Guest user on 10/08/2020

Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	121° 10' 00" E,30° 57' 23" S
Buffer	20km
Group By	Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	655	2936
Priority 1	10	34
Priority 2	4	7
Priority 3	7	14
Priority 4	2	2
Protected under international agreement	2	4
Rare or likely to become extinct	2	17
TOTAL	**682**	**3014**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Rare or likely to become extinct					
1.	11034	*Gastrolobium graniticum*		T	
2.	24557	*Leipoa ocellata (Malleefowl)*		T	
Protected under international agreement					
3.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
4.	24808	*Tringa nebularia (Common Greenshank, greenshank)*		IA	
Priority 1					
5.	44469	*Acacia coatesii*		P1	Y
6.	11765	*Acacia sclerophylla var. teretiuscula*		P1	
7.	3600	*Acacia websteri*		P1	
8.	36283	*Austrostipa sp. Carlingup Road (S. Kern & R. Jasper LCH 18459)*		P1	
9.	7463	*Dampiera plumosa*		P1	
10.	13053	*Eucalyptus websteriana subsp. norsemanica*		P1	
11.	30438	*Lepidosperma sp. Parker Range (N. Gibson & M. Lyons 2094)*		P1	
12.	16621	*Phebalium appressum*		P1	
13.	20680	*Thryptomene sp. Coolgardie (E. Kelso s.n. 1902)*		P1	Y
14.	36017	*Thryptomene sp. Londonderry (R.H. Kuchel 1763)*		P1	
Priority 2					
15.	34556	*Austrostipa sp. Dowerin (G. Wiehl F 8004)*		P2	
16.	16047	*Hakea rigida*		P2	
17.	3031	*Lepidium merrallii*		P2	
18.	4498	*Phebalium clavatum*		P2	
Priority 3					
19.	13897	*Allocasuarina eriochlamys subsp. grossa*		P3	
20.	17232	*Austrostipa blackii*		P3	
21.	47074	*Chrysocephalum apiculatum subsp. norsemanense*		P3	
22.	7278	*Eremophila veronica*		P3	
23.	2009	*Grevillea georgeana*		P3	
24.	48227	*Notisia intonsa*		P3	
25.	3059	*Phlegmatospermum eremaeum*		P3	
Priority 4					
26.	13641	*Eremophila caerulea subsp. merrallii*		P4	
27.	31815	*Eucalyptus jutsonii subsp. jutsonii*		P4	
Non-conservation taxon					
28.	3200	*Acacia acuminata (Jam, Mangard)*			
29.	14584	*Acacia ancistrophylla var. ancistrophylla*			
30.	3216	*Acacia andrewsii*			
31.	3236	*Acacia beauverdiana (Pukkati)*			
32.	3249	*Acacia calcarata*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
33.	3251	*Acacia camptoclada*			
34.	3256	*Acacia chrysella*			
35.	44514	*Acacia collegialis*			
36.	3264	*Acacia colletioides (Wait-a-while)*			
37.	3269	*Acacia coolgardiensis (Spinifex Wattle)*			
38.	15281	*Acacia desertorum var. desertorum*			
39.	3315	*Acacia duriuscula*			
40.	32118	*Acacia effusifolia*			
41.	3318	*Acacia enervia*			
42.	12257	*Acacia enervia subsp. explicata*			
43.	3324	*Acacia erinacea*			
44.	15282	*Acacia gibbosa*			
45.	3366	*Acacia hemiteles*			
46.	3378	*Acacia inaequiloba*			
47.	16164	*Acacia inceana subsp. inceana*			
48.	3393	*Acacia jennerae*			
49.	3408	*Acacia lasiocalyx (Silver Wattle, Wilyurwur)*			
50.	3416	*Acacia leptopetala*			
51.	3426	*Acacia longispinea*			
52.	3440	*Acacia merrallii*			
53.	3451	*Acacia multispicata*			
54.	3452	*Acacia murrayana (Sandplain Wattle)*			
55.	3463	*Acacia nyssophylla*			
56.	3478	*Acacia pachypoda*			
57.	3495	*Acacia prainii (Prain's Wattle)*			
58.	3504	*Acacia pycnantha (Golden Wattle)*	Y		
59.	3512	*Acacia rendlei*			
60.	3513	*Acacia resinimarginea*			
61.	3514	*Acacia resinistipulea*			
62.	3539	*Acacia sericocarpa*			
63.		*Acacia sp.*			
64.	3577	*Acacia tetragonophylla (Kurara, Wakalpuka)*			
65.	15292	*Acacia yorkrakinensis subsp. acrita*			
66.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
67.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
68.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
69.	24265	*Acanthiza uropygialis (Chestnut-rumped Thornbill)*			
70.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
71.	13904	*Allocasuarina acutivalvis subsp. acutivalvis*			
72.	1722	*Allocasuarina corniculata*			
73.		*Allodessus bistrigatus*			
74.	2652	*Alternanthera nodiflora (Common Joyweed)*			
75.	19467	*Aluta appressa*			
76.	19466	*Aluta aspera subsp. aspera*			
77.	6565	*Alyxia buxifolia (Dysentery Bush)*			
78.	12025	*Amphipogon caricinus var. caricinus*			
79.	11614	*Amyema gibberula var. gibberula*			
80.	2383	*Amyema preissii (Wireleaf Mistletoe)*			
81.		*Aname armigera*			
82.		*Aname mainae*			
83.	24312	*Anas gracilis (Grey Teal)*			
84.	24313	*Anas platyrhynchos (Mallard)*			
85.	24315	*Anas rhynchotis (Australasian Shoveler)*			
86.	24316	*Anas superciliosa (Pacific Black Duck)*			
87.	40910	*Androcalva luteiflora (Yellow-flowered Rulingia)*			
88.	7836	*Angianthus tomentosus (Camel-grass)*			
89.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
90.		*Anidiops villosus*			
91.	24561	*Anthochaera carunculata (Red Wattlebird)*			
92.	31876	*Arabidella chrysodema*			
93.	2992	*Arabidella trisecta*			
94.	41324	*Ardea modesta (great egret, white egret)*			
95.	24341	*Ardea pacifica (White-necked Heron)*			
96.	24610	*Ardeotis australis (Australian Bustard)*			
97.	207	*Aristida contorta (Bunched Kerosene Grass)*			
98.	12063	*Aristida holathera var. holathera*			
99.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
100.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
101.	24356	*Artamus personatus (Masked Woodswallow)*			
102.	27587	*Aspicilia calcarea*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
103.	7846	*Asteridea athrixioides*			
104.	20726	*Astus subroseus*			
105.	11489	*Atriplex acutibractea subsp. karoniensis*			
106.	2453	*Atriplex codonocarpa (Flat-topped Saltbush)*			
107.	2455	*Atriplex eardleyae*			
108.	2459	*Atriplex holocarpa (Pop Saltbush)*			
109.	11516	*Atriplex nummularia subsp. spathulata (Old Man Saltbush)*			
110.	11791	*Atriplex quadrivalvata var. quadrivalvata*			
111.	2478	*Atriplex spongiosa (Pop Saltbush)*			
112.	2481	*Atriplex vesicaria (Bladder Saltbush)*			
113.		*Austracantha minax*			
114.	17237	*Austrostipa elegantissima*			
115.	17238	*Austrostipa eremophila*			
116.	17246	*Austrostipa nitida*			
117.	17247	*Austrostipa platychaeta*			
118.	17251	*Austrostipa scabra*			
119.	17255	*Austrostipa trichophylla*			
120.	24318	*Aythya australis (Hardhead)*			
121.		*Backobourkia heroine*			
122.	5344	*Baeckea elderiana*			
123.	36038	*Baeckea sp. Koonadgin (B.L. Rye & M.E. Trudgen BLR 241137)*			
124.	1815	*Banksia elderiana (Swordfish Banksia)*			
125.		*Barnardius zonarius*			
126.		*Berosus nutans*			
127.	4598	*Beyeria lechenaultii (Pale Turpentine Bush)*			
128.	34257	*Beyeria sulcata var. sulcata*			
129.	25798	*Billardiera fusiformis (Australian Bluebell)*			
130.	24319	*Biziura lobata (Musk Duck)*			
131.	4409	*Boronia coerulescens*			
132.	18427	*Bossiaea cucullata*			
133.	7871	*Brachyscome ciliaris*			
134.	7880	*Brachyscome lineariloba*			
135.	7882	*Brachyscome perpusilla*			
136.	42381	*Brachyurophis semifasciatus (Southern Shovel-nosed Snake)*			
137.	3000	*Brassica tournefortii (Mediterranean Turnip)*	Y		
138.	19069	*Brunonia sp. Goldfields (K.R. Newbey 6044)*			
139.	25716	*Cacatua sanguinea (Little Corella)*			
140.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
141.	2853	*Calandrinia eremaea (Twining Purslane)*			
142.	96	*Callitris preissii (Rottnest Island Pine, Maro)*			
143.	5408	*Calothamnus gilesii*			
144.	7903	*Calotis hispidula (Bindy Eye)*			
145.	5442	*Calytrix birdii*			
146.	13654	*Calytrix breviseta subsp. stipulosa*			
147.	3008	*Carrichtera annua (Ward's Weed)*	Y		
148.	12658	*Casuarina pauper (Black Oak)*			
149.	258	*Cenchrus ciliaris (Buffel Grass)*	Y		
150.	7922	*Cephalipterum drummondii (Pompom Head)*			
151.	7924	*Ceratogyne obionoides (Wingwort)*			
152.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
153.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
154.	1215	*Chamaexeros fimbriata*			
155.	12818	*Cheilanthes sieberi subsp. sieberi*			
156.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
157.	2487	*Chenopodium curvispicatum*			
158.	47909	*Cheramoeca leucosterna (White-backed Swallow)*			
159.	271	*Chloris truncata (Windmill Grass)*			
160.	765	*Chrysitrix distigmatosa*			
161.	13138	*Chrysocephalum puteale*			
162.	48177	*Cladia muelleri*			
163.	28208	*Cladonia cervicornis subsp. verticillata*			
164.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
165.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
166.	24399	*Columba livia (Domestic Pigeon)*	Y		
167.	4553	*Comesperma drummondii (Drummond's Milkwort)*			
168.	4561	*Comesperma scoparium (Broom Milkwort)*			
169.	40923	*Commersonia craurophylla (Brittle Leaved Rulingia)*			
170.	40927	*Commersonia magniflora subsp. oblongifolia*			
171.	15611	*Conospermum stoechadis subsp. stoechadis (Common Smokebush)*			
172.	6612	*Convolvulus clementii*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
173.	7939	*Conyza bonariensis (Flaxleaf Fleabane)*	Y		
174.	20074	*Conyza sumatrensis*	Y		
175.	7419	*Coopernookia strophiolata*			
176.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
177.	24416	*Corvus bennetti (Little Crow)*			
178.	25592	*Corvus coronoides (Australian Raven)*			
179.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
180.	25595	*Cracticus tibicen (Australian Magpie)*			
181.	25596	*Cracticus torquatus (Grey Butcherbird)*			
182.	11709	*Crassula colorata var. acuminata*			
183.	11563	*Crassula colorata var. colorata*			
184.	20268	*Crassula tetramera*			
185.	7950	*Cratystylis microphylla (Small-leaved Grey Bush)*			
186.	16183	*Cryptandra aridicola*			
187.	4809	*Cryptandra pungens*			
188.	24871	*Ctenophorus cristatus (Bicycle Dragon)*			
189.	24874	*Ctenophorus isolepis subsp. citrinus (Yellowy Military Dragon)*			
190.	24882	*Ctenophorus nuchalis (Central Netted Dragon)*			
191.	24888	*Ctenophorus salinarum (Salt Pan Dragon)*			
192.	25026	*Ctenotus atlas*			
193.	25080	*Ctenotus uber subsp. uber (Spotted Ctenotus)*			
194.	17417	*Cullen discolor*			
195.	6747	*Cyanostegia angustifolia (Tinsel-flower)*			
196.	6751	*Cyanostegia microphylla (Tinsel Flower)*			
197.	25089	*Cyclodomorphus melanops subsp. elongatus (Slender Blue-tongue)*			
198.	24322	*Cygnus atratus (Black Swan)*			
199.	20281	*Cylindropuntia tunicata*	Y		Y
200.	290	*Dactyloctenium radulans (Button Grass)*			
201.	7451	*Dampiera lavandulacea*			
202.	7456	*Dampiera luteiflora (Yellow Dampiera)*			
203.	7477	*Dampiera stenostachya (Narrow-spiked Dampiera)*			
204.	13158	*Dampiera tenuicaulis var. curvula*			
205.	13159	*Dampiera tenuicaulis var. tenuicaulis*			
206.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
207.	41025	*Dasymalla terminalis (Native Foxglove)*			
208.	6218	*Daucus glochidiatus (Australian Carrot)*			
209.	3813	*Daviesia grahamii*			
210.	3823	*Daviesia nematophylla*			
211.	24995	*Delma australis*			
212.	25247	*Demansia psammophis subsp. psammophis (Yellow-faced Whipsnake)*			
213.	6771	*Dicrastylis parvifolia*			
214.	32346	*Didymodon torquatus*			
215.	25469	*Diplodactylus granariensis*			
216.	24929	*Diplodactylus granariensis subsp. granariensis*			
217.	24940	*Diplodactylus pulcher*			
218.	27725	*Diploschistes thunbergianus*			
219.	2499	*Dissocarpus paradoxus (Curious Saltbush)*			
220.	4753	*Dodonaea amblyophylla*			
221.	4769	*Dodonaea lobulata (Bead Hopbush)*			
222.	4770	*Dodonaea microzyga*			
223.	12034	*Dodonaea microzyga var. acrolobata*			
224.	4780	*Dodonaea stenozyga*			
225.	11247	*Dodonaea viscosa subsp. angustissima*			
226.	24470	*Dromaius novaehollandiae (Emu)*			
227.	49090	*Drosera sp. Branched styles (S.C. Coffey 193)*			
228.	24650	*Drymodes brunneopygia (Southern Scrub-robin)*			
229.	6966	*Duboisia hopwoodii (Pituri, Kundugu)*			
230.	33501	*Dysphania cristata (Crested Goosefoot)*			
231.	33480	*Dysphania pumilio (Clammy Goosefoot)*			
232.	25094	*Egernia formosa*			
233.		*Egretta novaehollandiae*			
234.		*Elanus axillaris*			
235.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
236.	2511	*Enchylaena tomentosa (Barrier Saltbush)*			
237.	12064	*Enchylaena tomentosa var. tomentosa (Barrier Saltbush)*			
238.	356	*Enneapogon avenaceus (Bottle Washers)*			
239.		*Enochrus elongatulus*			
240.		*Eolophus roseicapillus*			
241.	24651	*Eopsaltria australis subsp. griseogularis (Western Yellow Robin)*			
242.	24567	*Epthianura albifrons (White-fronted Chat)*			

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243.	376	*Eragrostis curvula (African Lovegrass)*	Y		
244.	378	*Eragrostis dielsii (Mallee Lovegrass)*			
245.	399	*Eragrostis xerophila (Knotty-butt Neverfail)*			
246.	25109	*Eremiascincus richardsonii (Broad-banded Sand Swimmer)*			
247.	7180	*Eremophila alternifolia (Poverty Bush)*			
248.	16377	*Eremophila caerulea subsp. caerulea*			
249.	13807	*Eremophila caperata*			
250.	7189	*Eremophila clarkei (Turpentine Bush)*			
251.	17156	*Eremophila clavata*			
252.	14895	*Eremophila decipiens subsp. decipiens*			
253.	7195	*Eremophila dempsteri*			
254.	7198	*Eremophila deserti*			
255.	7200	*Eremophila drummondii*			
256.	7212	*Eremophila gibbosa*			
257.	14340	*Eremophila glabra subsp. glabra*			
258.	7219	*Eremophila granitica (Thin-leaved Poverty Bush)*			
259.	15112	*Eremophila interstans subsp. interstans*			
260.	15111	*Eremophila interstans subsp. virgata*			
261.	7226	*Eremophila ionantha (Violet-flowered Eremophila)*			
262.	16363	*Eremophila maculata subsp. brevifolia (Native Fuchsia)*			
263.	14632	*Eremophila oblonga*			
264.	15003	*Eremophila oldfieldii subsp. angustifolia*			
265.	17168	*Eremophila oldfieldii subsp. oldfieldii*			
266.	18570	*Eremophila oppositifolia subsp. angustifolia*			
267.	14594	*Eremophila parvifolia subsp. auricampa*			
268.	15172	*Eremophila rugosa*			
269.	7264	*Eremophila saligna (Willowy Eremophila)*			
270.	7267	*Eremophila scoparia (Broom Bush ()*			
271.	17162	*Eremophila subfloccosa subsp. lanata*			
272.	417	*Eriachne pulchella (Pretty Wanderrie)*			
273.	45244	*Ericomyrtus serpyllifolia*			
274.	2514	*Eriochiton sclerolaenoides (Woolly Bindii)*			
275.		*Eriophora biapicata*			
276.	4332	*Erodium botrys (Long Storksbill)*	Y		
277.	4333	*Erodium cicutarium (Common Storksbill)*	Y		
278.	4334	*Erodium crinitum (Corkscrew)*			
279.	4335	*Erodium cygnorum (Blue Heronsbill)*			
280.	14377	*Erymophyllum ramosum subsp. ramosum*			
281.	5581	*Eucalyptus campaspe (Silver Gimlet)*			
282.	14300	*Eucalyptus celastroides subsp. celastroides (Mirret)*			
283.	48436	*Eucalyptus clelandiorum*			
284.	5607	*Eucalyptus corrugata (Rough-fruited Mallee)*			
285.	5612	*Eucalyptus cylindrocarpa (Woodline Mallee)*			
286.	34811	*Eucalyptus distuberosa subsp. distuberosa*			
287.	5637	*Eucalyptus eremophila (Tall Sand Mallee)*			
288.	15667	*Eucalyptus eremophila subsp. eremophila (Sand Mallee)*			
289.	5648	*Eucalyptus flocktoniae (Merrit, Merid)*			
290.	18521	*Eucalyptus flocktoniae subsp. flocktoniae*			
291.	14277	*Eucalyptus fraseri subsp. fraseri*			
292.	5665	*Eucalyptus griffithsii (Griffith's Grey Gum)*			
293.	5675	*Eucalyptus incrassata (Lerp Mallee)*			
294.	15682	*Eucalyptus leptophylla (Narrow-leaved Red Mallee)*			
295.	13056	*Eucalyptus leptopoda subsp. subluta*			
296.	5697	*Eucalyptus lesouefii (Goldfields Blackbutt)*			
297.	20802	*Eucalyptus longissima*			
298.	5726	*Eucalyptus oleosa (Giant Mallee)*			
299.	20091	*Eucalyptus oleosa subsp. oleosa*			
300.	5745	*Eucalyptus pileata (Capped Mallee)*			
301.	18580	*Eucalyptus planipes*			
302.	5747	*Eucalyptus platycorys (Boorabbin Mallee)*			
303.	19064	*Eucalyptus prolixa*			
304.	12380	*Eucalyptus ravida (Silver-topped Gimlet)*			
305.	5761	*Eucalyptus rigidula (Stiff-leaved Mallee)*			
306.	12693	*Eucalyptus salicola (Salt Gum)*			
307.	5766	*Eucalyptus salmonophloia (Salmon Gum, Wurak)*			
308.	5767	*Eucalyptus salubris (Gimlet)*			
309.	13027	*Eucalyptus tenera*			
310.	5792	*Eucalyptus torquata (Coral Gum)*			
311.	5793	*Eucalyptus transcontinentalis (Redwood, Pungul)*			
312.	18293	*Eucalyptus urna*			

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313.	34775	*Eucalyptus vittata*			
314.	5798	*Eucalyptus websteriana (Webster's Mallee)*			
315.	13054	*Eucalyptus websteriana subsp. websteriana*			
316.	5802	*Eucalyptus yilgarnensis (Yorrell)*			
317.	16722	*Euryomyrtus maidenii*			
318.	10977	*Exocarpos aphyllus (Leafless Ballart)*			
319.	25621	*Falco berigora (Brown Falcon)*			
320.	24471	*Falco berigora subsp. berigora (Brown Falcon)*			
321.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
322.	25623	*Falco longipennis (Australian Hobby)*			
323.	5197	*Frankenia desertorum*			
324.	5204	*Frankenia interioris*			
325.	5209	*Frankenia pauciflora (Seaheath)*			
326.	25727	*Fulica atra (Eurasian Coot)*			
327.	24957	*Gehyra purpurascens*			
328.	24959	*Gehyra variegata*			
329.	12780	*Gilberta tenuifolia*			
330.	29836	*Glandularia aristigera*	Y		
331.	33620	*Glischrocaryon angustifolium*			
332.	6143	*Glischrocaryon aureum (Common Popflower)*			
333.	3943	*Glycyrrhiza acanthocarpa (Native Liquorice)*			
334.	11801	*Gonocarpus confertifolius var. helmsii*			
335.	7499	*Goodenia concinna (Elegant Goodenia)*			
336.	7506	*Goodenia elderi*			
337.	7514	*Goodenia havilandii*			
338.	12523	*Goodenia helmsii*			
339.	7527	*Goodenia mimuloides*			
340.	7565	*Goodenia xanthosperma (Yellow-seeded Goodenia)*			
341.	24443	*Grallina cyanoleuca (Magpie-lark)*			
342.	1946	*Grevillea acacioides*			
343.	1949	*Grevillea acuaria*			
344.	1962	*Grevillea beardiana (Red Combs)*			
345.	1971	*Grevillea cagiana (Red Toothbrushes)*			
346.	13453	*Grevillea didymobotrya subsp. didymobotrya*			
347.	8832	*Grevillea excelsior (Flame Grevillea)*			
348.	14413	*Grevillea haplantha subsp. haplantha*			
349.	19314	*Grevillea hookeriana subsp. apiciloba*			
350.	19541	*Grevillea nematophylla subsp. nematophylla*			
351.	2056	*Grevillea paniculata*			
352.	2077	*Grevillea pterosperma*			
353.	13458	*Grevillea sarissa subsp. sarissa*			
354.	2104	*Grevillea teretifolia (Round Leaf Grevillea)*			
355.	2116	*Grevillea uncinulata (Hook-leaf Grevillea)*			
356.	2807	*Gunniopsis quadrifida (Sturts Pigface)*			
357.	2783	*Gyrostemon racemiger*			
358.	2163	*Hakea francisiana (Emu Tree)*			
359.	2182	*Hakea minyma*			
360.	6684	*Halgania andromedifolia*			
361.	29840	*Halgania cyanea var. Allambi Stn (B.W. Strong 676)*			
362.	31117	*Halgania cyanea var. Charleville (R.W. Purdie +111)*			
363.	6691	*Halgania integerrima*			
364.	24295	*Haliastur sphenurus (Whistling Kite)*			
365.	6180	*Haloragis trigonocarpa*			
366.	17725	*Hannafordia bissillii subsp. latifolia*			
367.	8008	*Helianthus annuus (Sunflower, Common Sunflower)*	Y		
368.	6710	*Heliotropium europaeum (Common Heliotrope)*	Y		
369.	25115	*Hemiergis initialis subsp. initialis*			
370.	6776	*Hemiphora elderi (Red Velvet)*			
371.	42408	*Hesperoedura reticulata*			
372.	24961	*Heteronotia binoei (Bynoe's Gecko)*			
373.	4941	*Hibiscus solanifolius*			
374.	47965	*Hieraaetus morphnoides (Little Eagle)*			
375.	25734	*Himantopus himantopus (Black-winged Stilt)*			
376.	24491	*Hirundo neoxena (Welcome Swallow)*			
377.	5815	*Homalocalyx thryptomenoides*			
378.	15447	*Hyalosperma glutinosum subsp. glutinosum*			
379.	12756	*Hyalosperma zacchaeus*			
380.	11973	*Hybanthus floribundus subsp. curvifolius*			
381.	48651	*Hysterobaeckea ochropetala subsp. reliqua*			
382.		*Idiommata blackwalli*			

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383.	8087	*Isoetopsis graminifolia (Cushion Grass)*			
384.	911	*Isolepis congrua*			
385.	7397	*Isotoma petraea (Rock Isotome, Tundiwari)*			
386.	4043	*Kennedia prorepens*			
387.	6779	*Lachnostachys coolgardiensis*			
388.		*Lampona cylindrata*			
389.		*Latrodectus hasseltii*			
390.	4957	*Lawrencia repens*			
391.	7569	*Lechenaultia brevifolia*			
392.	27825	*Lecidea ochroleuca*			
393.	19237	*Leiocarpa websteri*			
394.	12628	*Lemooria burkittii*			
395.	3034	*Lepidium papillosum (Warty Peppercress)*			Y
396.	1073	*Lepidobolus chaetocephalus (Bristle-headed Chaff Rush)*			
397.	1074	*Lepidobolus deserti*			
398.		*Lepidosperma sp.*			
399.	471	*Leptochloa digitata (Whorled Cane Grass)*			
400.	4056	*Leptosema daviesioides*			
401.	5848	*Leptospermum fastigiatum*			
402.	12692	*Leptospermum subtenue*			
403.	25155	*Lerista muelleri*			
404.	25162	*Lerista picturata*			
405.	42411	*Lerista timida*			
406.	6401	*Leucopogon hamulosus*			
407.	16049	*Leucopogon sp. Clyde Hill (M.A. Burgman 1207)*			
408.	25659	*Lichenostomus leucotis (White-eared Honeyeater)*			
409.	25661	*Lichmera indistincta (Brown Honeyeater)*			
410.	6489	*Limonium sinuatum (Perennial Sea Lavender)*	Y		
411.	4061	*Lotus cruentus (Redflower Lotus)*			
412.	30935	*Lucasium maini*			
413.	6967	*Lycium australe (Australian Boxthorn)*			
414.	5281	*Lythrum hyssopifolia (Lesser Loosestrife)*	Y		
415.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
416.	2535	*Maireana appressa*			
417.	2542	*Maireana erioclada*			
418.	2543	*Maireana eriosphaera*			
419.	2544	*Maireana georgei (Satiny Bluebush)*			
420.	2545	*Maireana glomerifolia (Ball Leaf Bluebush)*			
421.	2554	*Maireana pentagona (Hairy Bluebush)*			
422.	2555	*Maireana pentatropis*			
423.	2560	*Maireana pyramidata (Sago Bush)*			
424.	2561	*Maireana radiata*			
425.	2565	*Maireana suaedifolia*			
426.	2567	*Maireana tomentosa (Felty Bluebush)*			
427.	11662	*Maireana tomentosa subsp. tomentosa*			
428.	2568	*Maireana trichoptera (Downy Bluebush)*			
429.	2569	*Maireana triptera (Threewinged Bluebush)*			
430.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
431.	5864	*Malleostemon peltiger*			
432.	5865	*Malleostemon roseus*			
433.	5866	*Malleostemon tuberculatus*			
434.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
435.	24551	*Malurus pulcherrimus (Blue-breasted Fairy-wren)*			
436.	25654	*Malurus splendens (Splendid Fairy-wren)*			
437.	4961	*Malva parviflora (Marshmallow)*	Y		
438.	41544	*Malva weinmanniana*			
439.	24583	*Manorina flavigula (Yellow-throated Miner)*			
440.	19421	*Marianthus bicolor (Painted Marianthus)*			
441.	6881	*Marrubium vulgare (Horehound)*	Y		
442.	12949	*Marsdenia australis*			
443.	4077	*Medicago minima (Small Burr Medic)*	Y		
444.	15063	*Melaleuca acuminata subsp. acuminata*			
445.	19380	*Melaleuca calyptroides*			
446.	5896	*Melaleuca cordata*			
447.	5909	*Melaleuca elliptica (Granite Bottlebrush, Ngow)*			
448.	19486	*Melaleuca hamata*			
449.	5922	*Melaleuca lanceolata (Rottnest Teatree, Moonah)*			
450.	5925	*Melaleuca lateriflora (Gorada)*			
451.	5929	*Melaleuca leiocarpa*			
452.	14700	*Melaleuca macronychia subsp. macronychia*			

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453.	15663	*Melaleuca pauperiflora subsp. fastigiata*			
454.	20287	*Melaleuca zeteticorum*			
455.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
456.	25184	*Menetia greyii*			
457.	24598	*Merops ornatus (Rainbow Bee-eater)*			
458.	954	*Mesomelaena preissii*			
459.	25693	*Microeca fascinans (Jacky Winter)*			
460.	9187	*Micromyrtus erichsenii*			
461.	19787	*Micromyrtus monotaxis*			
462.	8105	*Millotia myosotidifolia*			
463.	4089	*Mirbelia depressa*			
464.	4094	*Mirbelia microphylla*			
465.	4097	*Mirbelia ramulosa*			
466.	4099	*Mirbelia seorsifolia*			
467.	24904	*Moloch horridus (Thorny Devil)*			
468.	490	*Monachather paradoxus*			
469.	29418	*Monoculus monstrosus*	Y		
470.	4664	*Monotaxis luteiflora*			
471.	25240	*Morelia spilota subsp. imbricata (Carpet Python)*			
472.	24223	*Mus musculus (House Mouse)*	Y		
473.	14186	*Myriocephalus pygmaeus*			
474.	25425	*Neobatrachus kunapalari (Kunapalari Frog)*			
475.	25426	*Neobatrachus pelobatoides (Humming Frog)*			
476.	25427	*Neobatrachus sutor (Shoemaker Frog)*			
477.		*Nicodamus mainae*			
478.	6978	*Nicotiana rotundifolia (Round-leaved Tobacco)*			
479.	24096	*Ningaui yvonneae (Southern Ningaui)*			
480.	24229	*Notomys mitchellii (Mitchell's Hopping-mouse)*			
481.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
482.	8134	*Olearia exiguifolia (Small-leaved Daisy Bush)*			
483.	8136	*Olearia homolepis*			
484.	19023	*Olearia incana*			
485.	8140	*Olearia muelleri (Goldfields Daisy)*			
486.	8145	*Olearia pimeleoides (Pimelea Daisybush, Burrobunga)*			
487.	8149	*Olearia rudis (Rough Daisybush)*			
488.	44401	*Olearia sp. Eremicola (Diels & Pritzel s.n. PERTH 00449628)*			
489.	8152	*Olearia subspicata (Spiked Daisy Bush)*			
490.	31799	*Opuntia elata*	Y		
491.	24618	*Oreoica gutturalis (Crested Bellbird)*			
492.		*Ostracoda (unident.)*			
493.	4355	*Oxalis perennans*			
494.		*Ozestheria packardi*			
495.	12642	*Ozothamnus cassiope*			
496.	24619	*Pachycephala inornata (Gilbert's Whistler)*			
497.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
498.	2964	*Papaver hybridum (Rough Poppy)*	Y		
499.	25253	*Parasuta gouldii*			
500.	25254	*Parasuta monachus*			
501.	25682	*Pardalotus striatus (Striated Pardalote)*			
502.	40424	*Pentameris airoides subsp. airoides*	Y		
503.	2274	*Persoonia saundersiana*			
504.	3674	*Petalostylis cassioides*			
505.	48060	*Petrochelidon ariel (Fairy Martin)*			
506.	48061	*Petrochelidon nigricans (Tree Martin)*			
507.	24659	*Petroica goodenovii (Red-capped Robin)*			
508.	2308	*Petrophile seminuda*			
509.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
510.	552	*Phalaris paradoxa (Paradoxa Grass)*	Y		
511.	24409	*Phaps chalcoptera (Common Bronzewing)*			
512.	4497	*Phebalium canaliculatum*			
513.	14883	*Phebalium laevigatum*			
514.	4501	*Phebalium lepidotum*			
515.	4504	*Phebalium tuberculosum*			
516.	18506	*Philotheca tomentella*			
517.	5231	*Pimelea angustifolia (Narrow-leaved Pimelea)*			
518.	11185	*Pimelea microcephala subsp. microcephala*			
519.	12104	*Pimelea spiculigera var. thesioides*			
520.	11910	*Pimelea suaveolens subsp. flava*			
521.	19744	*Pittosporum angustifolium*			
522.	6812	*Pityrodia lepidota*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
523.	7300	*Plantago drummondii (Sago Weed)*			
524.	14198	*Plantago sp. Mt Magnet (A.S. George 6793)*			
525.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
526.	25703	*Podargus strigoides (Tawny Frogmouth)*			
527.	45238	*Podolepis aristata subsp. affinis*			
528.	8173	*Podolepis capillaris (Wiry Podolepis)*			
529.	8177	*Podolepis lessonii*			
530.	8180	*Podolepis rugata (Pleated Podolepis)*			
531.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
532.	8187	*Pogonolepis muelleriana*			
533.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
534.	30854	*Polytelis anthopeplus subsp. westralis (Regent Parrot)*			
535.	4815	*Pomaderris forrestiana*			
536.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
537.	2884	*Portulaca oleracea (Purslane, Wakati)*			
538.	24769	*Porzana fluminea (Australian Spotted Crake)*			
539.	15822	*Prostanthera althoferi subsp. althoferi*			
540.	6912	*Prostanthera campbellii*			
541.	6916	*Prostanthera grylloana*			
542.	6917	*Prostanthera incurvata*			
543.	24237	*Pseudomys hermannsburgensis (Sandy Inland Mouse)*			
544.	25263	*Pseudonaja modesta (Ringed Brown Snake)*			
545.	25434	*Pseudophryne occidentalis (Western Toadlet)*			
546.	27998	*Psora crenata*			
547.	28000	*Psora decipiens*			
548.	12216	*Pterostylis roensis*			
549.	18657	*Pterostylis sp. inland (A.C. Beauglehole 11880)*			
550.	48481	*Pterostylis tryphera*			
551.	2707	*Ptilotus carlsonii*			
552.	48602	*Ptilotus eremita*			
553.	2721	*Ptilotus exaltatus (Tall Mulla Mulla)*			
554.	2727	*Ptilotus gaudichaudii*			
555.	2729	*Ptilotus grandiflorus*			
556.	2732	*Ptilotus holosericeus*			
557.	2747	*Ptilotus obovatus (Cotton Bush)*			
558.	42344	*Purnella albifrons (White-fronted Honeyeater)*			
559.	24278	*Pyrrholaemus brunneus (Redthroat)*			
560.	4964	*Radyera farragei (Knobby Hibiscus)*			
561.	2581	*Rhagodia drummondii*			
562.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
563.	13306	*Rhodanthe battii*			
564.	13241	*Rhodanthe chlorocephala subsp. rosea*			
565.	13301	*Rhodanthe floribunda*			
566.	13293	*Rhodanthe haigii*			
567.	13234	*Rhodanthe manglesii*			
568.	13249	*Rhodanthe oppositifolia subsp. oppositifolia*			
569.	13252	*Rhodanthe pygmaea*			
570.	13253	*Rhodanthe rubella*			
571.	24982	*Rhynchoedura ornata (Western Beaked Gecko)*			
572.	4701	*Ricinocarpos stylosus*			
573.	4704	*Ricinocarpos velutinus*			
574.	6018	*Rinzia carnosa (Fleshy-leaved Rinzia)*			
575.	48882	*Roepera apiculata*			
576.	48892	*Roepera glauca (Pale Twinleaf, Pale Twin-leaf)*			
577.	48898	*Roepera ovata*			
578.	48899	*Roepera reticulata*			
579.	2443	*Rumex vesicarius (Ruby Dock)*	Y		
580.	40425	*Rytidosperma caespitosum*			
581.	40427	*Rytidosperma setaceum*			
582.	30434	*Salsola australis*			
583.	6928	*Salvia reflexa (Mintweed)*	Y		
584.	6929	*Salvia verbenaca (Wild Sage)*	Y		
585.	2356	*Santalum acuminatum (Quandong, Warnga)*			
586.	2359	*Santalum spicatum (Sandalwood, Wilarak)*			
587.	7644	*Scaevola spinescens (Currant Bush, Maroon)*			
588.	17056	*Schinus molle var. areira*	Y		
589.	8200	*Schoenia cassiniana (Schoenia)*			
590.	13287	*Schoenia filifolia subsp. filifolia*			
591.	1015	*Schoenus subaphyllus*			
592.	2606	*Sclerolaena cuneata (Yellow Bindii)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
593.	2609	*Sclerolaena diacantha (Grey Copperburr)*			
594.	2610	*Sclerolaena drummondii*			
595.	2615	*Sclerolaena fusiformis*			
596.	2625	*Sclerolaena obliquicuspis (Limestone Bindii)*			
597.		*Scolopendra laeta*			
598.		*Scolopendra morsitans*			
599.	8207	*Senecio glossanthus (Slender Groundsel)*			
600.	25881	*Senecio lacustrinus*			
601.	17645	*Senna artemisioides*			
602.	12276	*Senna artemisioides subsp. filifolia*			
603.	17558	*Senna artemisioides subsp. x artemisioides*			
604.	18430	*Senna cardiosperma*			
605.	16378	*Senna pleurocarpa*			
606.	12315	*Senna pleurocarpa var. angustifolia*			
607.	12314	*Senna pleurocarpa var. pleurocarpa*			
608.	14579	*Senna sp. Austin (A. Strid 20210)*			
609.	18446	*Senna stowardii*			
610.	46824	*Seringia velutina (Velvet firebush)*			
611.	4970	*Sida calyxhymenia (Tall Sida)*			
612.	16924	*Sida spodochroma*			
613.	25266	*Simoselaps bertholdi (Jan's Banded Snake)*			
614.	28060	*Siphula coriacea*			
615.	3072	*Sisymbrium orientale (Indian Hedge Mustard)*	Y		
616.	30948	*Smicrornis brevirostris (Weebill)*			
617.	24108	*Sminthopsis crassicaudata (Fat-tailed Dunnart)*			
618.	24109	*Sminthopsis dolichura (Little long-tailed Dunnart)*			
619.	6998	*Solanum cleistogamum*			
620.	7013	*Solanum hoplopetalum (Thorny Solanum)*			
621.	7018	*Solanum lasiophyllum (Flannel Bush, Mindjulu)*			
622.	7023	*Solanum nummularium (Money-leaved Solanum)*			
623.	7030	*Solanum plicatile*			
624.	2914	*Spergularia diandra (Lesser Sand Spurry)*	Y		
625.	4734	*Stackhousia muricata*			
626.	3076	*Stenopetalum filifolium*			
627.	3077	*Stenopetalum lineare (Narrow Thread Petal)*			
628.	25597	*Strepera versicolor (Grey Currawong)*			
629.	8238	*Streptoglossa liatroides*			
630.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
631.	24923	*Strophurus assimilis (Goldfields Spiny-tailed Gecko)*			
632.	24927	*Strophurus elderi*			
633.	7685	*Stylidium arenicola*			
634.	7714	*Stylidium dielsianum (Tangle Triggerplant)*			
635.	7751	*Stylidium limbatum (Fringed-leaved Triggerplant)*			
636.	25269	*Suta fasciata (Rosen's Snake)*			
637.	4220	*Swainsona canescens (Grey Swainsona)*			
638.	4221	*Swainsona colutoides (Bladder Vetch)*			
639.	4231	*Swainsona kingii*			
640.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
641.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
642.	30870	*Taeniopygia guttata (Zebra Finch)*			
643.		*Tamopsis circumvidens*			
644.		*Tasmanicosa leuckartii*			
645.	31492	*Tecticornia disarticulata*			
646.	2822	*Tetragonia eremaea*			
647.	4530	*Tetratheca efoliata*			
648.	1701	*Thelymitra antennifera (Vanilla Orchid)*			
649.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
650.	6058	*Thryptomene kochii*			
651.	6068	*Thryptomene urceolaris*			
652.	1338	*Thysanotus manglesianus (Fringed Lily)*			
653.		*Thysanotus sp.*			
654.	6279	*Trachymene ornata (Spongefruit)*			
655.	48141	*Tribonyx ventralis (Black-tailed Native-hen)*			
656.	12652	*Trichanthodium skirrophorum*			
657.	16986	*Trymalium myrtillus subsp. myrtillus*			
658.	24851	*Turnix velox (Little Button-quail)*			
659.	30814	*Tympanocryptis cephalus (Pebble Dragon)*			
660.	39408	*Tympanocryptis lineata (Lined Earless Dragon)*			
661.	24983	*Underwoodisaurus milii (Barking Gecko)*			
662.	18326	*Urochloa panicoides*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
663.		*Uromycladium tepperianum*			
664.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
665.	7658	*Velleia discophora (Cabbage Poison)*			
666.	7664	*Velleia rosea (Pink Velleia)*			
667.	6073	*Verticordia chrysantha*			
668.	6109	*Verticordia picta (Painted Featherflower)*			
669.	6113	*Verticordia pritzelii (Pritzel's Featherflower)*			
670.	24206	*Vespadelus regulus (Southern Forest Bat)*			
671.	17261	*Vicia monantha subsp. triflora*	Y		
672.	48986	*Vincetoxicum lineare*			
673.	11387	*Vittadinia cervicularis var. cervicularis*			
674.	8273	*Vittadinia sulcata*			
675.	7386	*Wahlenbergia gracilenta (Annual Bluebell)*			
676.	13331	*Waitzia acuminata var. acuminata*			
677.	46093	*Waitzia fitzgibbonii*			
678.	6938	*Westringia cephalantha*			
679.	34603	*Westringia cephalantha var. caterva*			
680.	9247	*Westringia rigida (Stiff Westringia)*			
681.	28327	*Xanthoparmelia semiviridis*			
682.	28186	*Xanthoparmelia versicolor*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

Appendix C: EPBC Protected Matters Search Results

Australian Government

Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

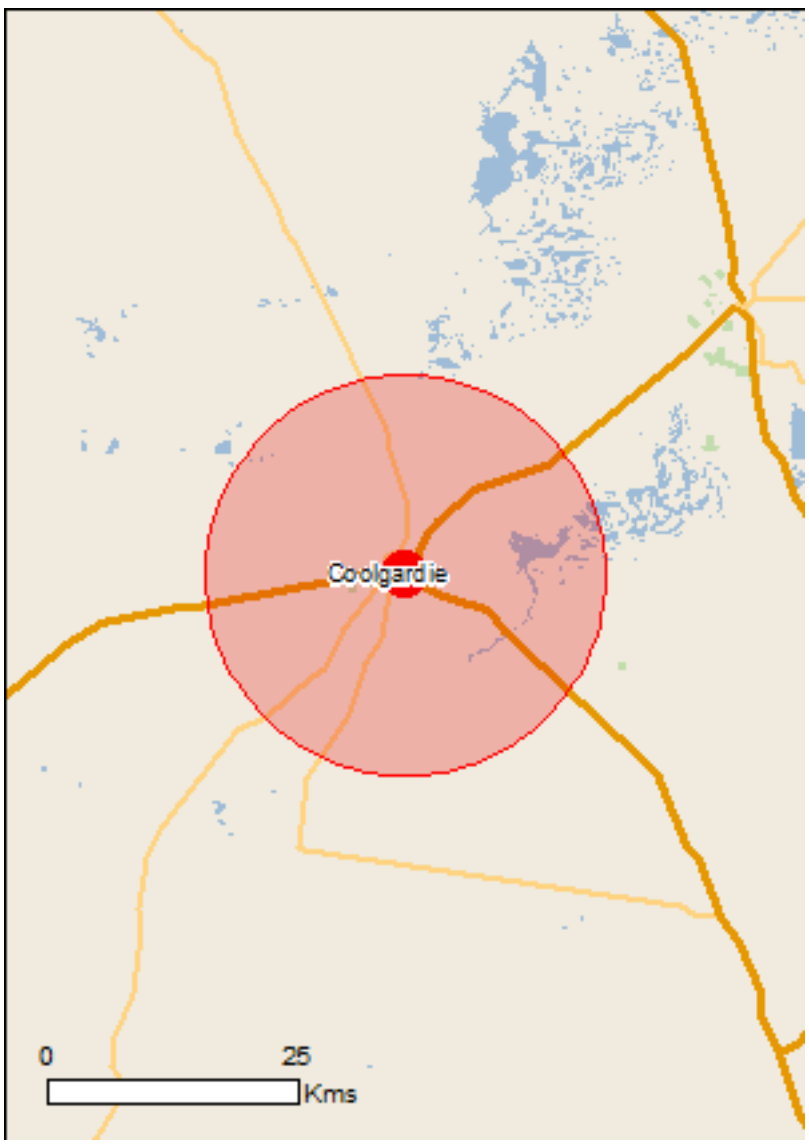
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 13/01/21 12:32:36

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

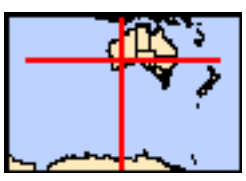
Caveat
Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

Coordinates

Buffer: 20.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	7
Listed Migratory Species:	7

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	12
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	3
Regional Forest Agreements:	None
Invasive Species:	14
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

National Heritage Properties		[Resource Information]
Name	State	Status
Historic		
Goldfields Water Supply Scheme, Western Australia	WA	Listed place

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area
Plants		
Gastrolobium graniticum Granite Poison [14872]	Endangered	Species or species habitat may occur within area
Thelymitra stellata Star Sun-orchid [7060]	Endangered	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		

Name	Threatened	Type of Presence
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Kangaroo Hills Timber Reserve	WA
Scahill Timber Reserve	WA
Yallari Timber Reserve	WA

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Equus asinus Donkey, Ass [4]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Carrichtera annua Ward's Weed [9511]		Species or species habitat likely to occur within area
Cylindropuntia spp. Prickly Pears [85131]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-30.95426 121.17718

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Appendix D: NVIS Structural Formation Terminology (NVIS TWG 2017)

Cover Characteristics								
Foliage cover*		70-100	30-70	10-30	<10	≈0	0-5	unknown
Crown cover**		>80	50-80	20-50	0.25-20	<0.25	0-5	unknown
% Cover***		>80	50-80	20-50	0.25-20	<0.25	0-5	unknown
Cover code****		d	c	i	r	bi	bc	unknown
Growth Form	**Height Ranges (m)**	**Structural Formation Classes**						
tree, palm	<10,10-30, >30	closed forest	open forest	woodland	open woodland	isolated trees	isolated clumps of trees	trees
tree mallee	<3, <10, 10-30	closed mallee forest	open mallee forest	mallee woodland	open mallee woodland	isolated mallee trees	isolated clumps of mallee trees	mallee trees
shrub, cycad, grass-tree, tree-fern	<1,1-2,>2	closed shrubland	shrubland	open shrubland	sparse shrubland	isolated shrubs	isolated clumps of shrubs	shrubs
mallee shrub	<3, <10, 10-30	closed mallee shrubland	mallee shrubland	open mallee shrubland	sparse mallee shrubland	isolated mallee shrubs	isolated clumps of mallee shrubs	mallee shrubs
heath shrub	<1,1-2,>2	closed heathland	heathland	open heathland	sparse heathland	isolated heath shrubs	isolated clumps of heath shrubs	heath shrubs
chenopod shrub	<1,1-2,>2	closed chenopod shrubland	chenopod shrubland	open chenopod shrubland	sparse chenopod shrubland	isolated chenopod shrubs	isolated clumps of chenopod shrubs	chenopod shrubs
samphire shrub	<0.5,>0.5	closed samphire shrubland	samphire shrubland	open samphire shrubland	sparse samphire shrubland	isolated samphire shrubs	isolated clumps of samphire shrubs	samphire shrubs
hummock grass	<2,>2	closed hummock grassland	hummock grassland	open hummock grassland	sparse hummock grassland	isolated hummock grasses	isolated clumps of hummock grasses	hummock grasses
tussock grass	<0.5,>0.5	closed tussock grassland	tussock grassland	open tussock grassland	sparse tussock grassland	isolated tussock grasses	isolated clumps of tussock grasses	tussock grasses
other grass	<0.5,>0.5	closed grassland	grassland	open grassland	sparse grassland	isolated grasses	isolated clumps of grasses	other grasses
edge	<0.5,>0.5	closed sedgeland	sedgeland	open sedgeland	sparse sedgeland	isolated sedges	isolated clumps of sedges	sedges
rush	<0.5,>0.5	closed rushland	rushland	open rushland	sparse rushland	isolated rushes	isolated clumps of rushes	rushes
forb	<0.5,>0.5	closed forbland	forbland	open forbland	sparse forbland	isolated forbs	isolated clumps of forbs	forbs
fern	<1,1-2,>2	closed fernland	fernland	open fernland	sparse fernland	isolated ferns	isolated clumps of ferns	ferns
bryophyte	<0.5	closed bryophyteland	bryophyteland	open bryophyteland	sparse bryophyteland	isolated bryophytes	isolated clumps of bryophytes	bryophytes
lichen	<0.5	closed lichenland	lichenland	open lichenland	sparse lichenland	isolated lichens	isolated clumps of lichens	lichens
vine	<10,10-30, >30	closed vineland	vineland	open vineland	sparse vineland	isolated vines	isolated clumps of vines	vines
aquatic	0-0.5, <1	closed aquatic bed	aquatic bed	open aquatic bed	sparse aquatics	isolated aquatics	isolated clumps of aquatics	aquatics
seagrass	0-0.5, <1	closed seagrass bed	seagrassbed	open seagrassbed	sparse seagrassbed	isolated seagrasses	isolated clumps of seagrasses	seagrasses

*refer notes below.

Notes

The table is based on native vegetation, but can be used in a similar fashion for non-native vegetation and revegetation.

* Foliage Cover is defined for each stratum as 'the proportion of the ground, which would be shaded if sunshine came from directly overhead'. It includes branches and leaves and is obtained by multiplying Crown Cover with Crown type

(Hnatiuk *et al* 2009). It is applied to a stratum in a plot, rather than an individual crown, with the NVIS measure for a vegetation type ideally being a summary of several plots. Foliage Projective Cover, which considers only the vertical projection of photosynthetic components (generally leaves), can be measured by line interception methods for tree, shrub and ground layer vegetation (Specht, R.L and Specht 1999).

** Crown Cover (canopy cover) as per Hnatiuk *et al* (2009). Although relationships between this attribute and Foliage Cover are dependent on season, species, species age etc., the crown cover category classes have been adopted as the defining measure.

*** The percentage cover is defined as the percentage of a strictly defined plot area, covered by vegetation. This can be an estimate and is a less precise measure than using, for example, a point intercept transect method on ground layer, or overstorey vegetative cover. That is, for precisely measured values (e.g. crown densitometer or point intercept transects) the value measured would be 'foliage' cover. Where less precise or qualitative measures are used these will most probably be recorded as 'percentage' cover.

The last column of the Table is designed to cater for situations, in existing data, where the cover value for the growth form is unknown.

Appendix E: All species collected during the Targeted flora survey

Family	Species	Conservation Code
Amaranthaceae	*Atriplex* sp.	
	Atriplex vesicaria	
	Enchylaena tomentosa var. *tomentosa*	
	Ptilotus obovatus	
	Ptilotus helichrysoides	
Anacardiaceae	*Schinus molle*	Introduced
Apocynaceae	*Alyxia buxifolia*	
	Vincetoxicum lineare	
Asparagaceae	*Agave americana*	Naturalised
Asphodelaceae	*Asphodelus fistulosus*	Introduced
Asteraceae	*Cratystylis conocephala*	
	Olearia muelleri	
	Olearia pimeleoides	
Cactaceae	*Opuntia stricta*	WONS
Campanulaceae	*Isotoma petraea*	
Casuarinaceae	*Allocasuarina acutivalvis* subsp. *acutivalvis*	
	Allocasuarina campestris	
	Allocasuarina helmsii	
	Casuarina pauper	
Chenopodiaceae	*Maireana brevifolia*	
	Maireana pyramidata	
	Maireana radiata	
	Maireana sedifolia	
	Maireana sp.	
	Maireana sp.	
	?Maireana sp.	
	Maireana triptera	
	Rhagodia spinescens	
	Salsola australis	
	Sclerolaena diacantha	
	Tecticornia disarticulata	
Convolvulaceae	*Convolvulus recurvatus*	
Euphorbiaceae	*Beyeria ?sulcata*	
Fabaceae	*Acacia acuminata*	
	Acacia collegialis	
	Acacia erinacea	
	Acacia excentrica	
	Acacia hemiteles	
	Acacia multispicata	
	Acacia websteri	P1
	Acacia tetragonophylla	
	Senna artemisioides subsp. *filifolia*	
Frankeniaceae	*Frankenia fecunda*	
Hemerocallidaceae	*Dianella revoluta*	
Goodeniaceae	*Scaevola spinescens*	
Lamiaceae	*Prostanthera grylloana*	
	Prostanthera incurvata	
	Westringia rigida	
Malvaceae	*Sida spodochroma*	
	Solanum nummularium	

Family	Species	Conservation Code
Myrtaceae	*Eucalyptus campaspe*	
	Eucalyptus celastroides	
	Eucalyptus clelandiorum	
	Eucalyptus griffithsii	
	Euryomyrtus maidenii	
	Eucalyptus oleosa subsp. *oleosa*	
	Eucalyptus salmonophloia	
	Eucalyptus torquata	
	Eucalyptus transcontinentalis	
	Melaleuca hamata	
	Melaleuca sheathiana	
Pittosporaceae	*Pittosporum angustifolium*	
Poaceae	*Austrostipa* sp.	
	Cynodon dactylon	
	Enneapogon caerulescens	
	Eragrostis sp.	
	Rytidosperma acerosum	
	Sporobolus ramigerus	
	Triodia tomentosa	
	Paspalidium basicladum	
Proteaceae	*Grevillea acuaria*	
	Hakea ?platysperma	
Rhamnaceae	*Cryptandra aridicola*	
Rutaceae	*Phebalium* sp.	
Santalaceae	*Santalum acuminatum*	
Sapindaceae	*Dodonaea lobulata*	
	Dodonaea microzyga	
	Dodonaea stenozyga	
Scrophulariaceae	*Eremophila ?decipiens*	
	Eremophila drummondii	
	Eremophila gibbosa	
	Eremophila glabra subsp. *glabra*	
	Eremophila interstans subsp. *interstans*	
	Eremophila linearis	
	Eremophila oldfieldii	
	Eremophila oppositifolia	
	*Eremophila parvifolia ?*subsp. *auricampi*	
	Eremophila parvifolia subsp. *auricampi*	
	Eremophila scoparia	
	Eremophila sp.	
	Eremophila sp.	
	Myoporum sp.	
Solanaceae	*Lycium australe*	
	Lycium ferocissimum	WONS
	Solanum lasiophyllum	

Appendix F: Priority Flora of Recorded Genera Likelihood of Occurrence Assessment

Collection	Potential Priority Species	Conservation Status	Habitat		Flowering time (WA Herbarium 2021)	Details from record within 20km of Survey Area (DBCA 2020d)			Likelihood Occurrence in Survey Area
			Soils and Landscape	Associated Vegetation		Distance and Direction	Soils and Landscape	Associated Vegetation	
Austrostipa sp. (CS84)	*Austrostipa blackii*	Priority 2	Heavy soils (Sharp and Simon 2002)	Not described	Sep to Nov	2.2km SW	West north-west facing gently inclined lower slope of basalt with red-brown deep sandy clay loam soils	Mid-dense mallee woodland of *Eucalyptus griffithsii* over open shrubland *of Dodonaea lobulata* and *Eremophila glabra* subsp. *glabra* over sparse low shrubland of *Ptilotus obovatus*.	Likely
	Austrostipa sp. *Carlingup Road*	Priority 1	Not described	Not described	2 records in Sep and Oct (ALA 2021)	9.6km WSW	North north-east facing gently inclined mid-slope of basalt with red-brown shallow sandy soils.	Open tall shrubland of *Acacia* sp. Norseman over mid-dense shrubland of *Dodonaea lobulata* and *Eremophila oldfieldii* subsp. *angustifolia* over sparse low shrubland of *Ptilotus obovatus*.	Unlikely
	Austrostipa sp. *Dowerin*	Priority 2	Not described	Not described	8 records in Oct. 1 in Nov (ALA 2021)	6.7km SE	South-east facing moderately inclined upper slope of basalt. Very slightly rocky basalt outcrop with red-brown shallow sandy clay loam soils.	Open tall shrubland of *Acacia* sp. *Norseman* over sparse shrubland *of Dodonaea lobulata* over open low shrubland of *Ptilotus obovatus*.	Unlikely
*Eremophila spp. (*CS10, CS32)	*Eremophila caerulea* subsp. *merrallii*	Priority 4	Sand, clay or loam on undulating plains (WA Herbarium 2020; (Brown and Buirchell 2011 p51).	*Eucalyptus salubris*, E. *eremophil*a and *Eremophila decipiens* (Brown and Buirchell 2011 p51)	Oct to Dec (Brown and Buirchell 2011 p. 51)	5.6km N	No information provided.	No information provided.	Unlikely

	Eremophila veronica	Priority 3	Stony clay, clay loam. Lateritic breakaways (WA Herbarium 2020) Rocky-brown clays soil (Brown and Buirchell 2011 p.279)	Found in low *Eucalyptus salubris, E. grafitthsii, E. campaspe*, woodland with *Atriplex buburyana, Santalum acuminatum* and *Eremophila ionantha* (Brown and Buirchell 2011 p.279).	Apr to May	530m W and 7.7km SW	Partly disturbed area.	Woodland, *Eucalyptus salubris, Acacia burkittii, Cylindropuntia tunicata*. And Low Woodland of *Eucalyptus salubris* with *Atriplex bunburyana, Santalum acuminatum.*	Very Likely
Phebalium sp. (CS68)	*Phebalium appressum*	Priority 1	Yellow sandplain (WA Herbarium 2021)		Jul	Approx. 14 and 20km NW	Mid slope between mallee woodland and sandplain heath. Brown sandy loam. And Yellow Sand Plain	Open tree mallee over low scrub (*Acacia burkittii, Melaleuca hamata*) over dwarf scrub (*Baeckea* sp.) over *Triodia*.	Unlikely
	Phebalium clavatum	Priority 3	Sandplains (WA Herbarium 2021)		Aug to Sep	10.5km SSW	No information provided	No information provided	Unlikely

Appendix G: Vegetation Community Detailed Descriptions

Table G. 1: Community 1 Details: *Eucalyptus griffithsii* with *E. torquata* Mallee woodland

NVIS Description				
Mallee woodland <10m of *Eucalyptus griffithsii* and *Eucalyptus torquata* over sparse mallee shrubland <3m of *Eremophila* sp., *Exocarpos aphyllus, Dodonaea stenozyga* and *Senna artemisioides* subsp. *filifolia* over open heathland <1m of *Scaevola spinescens, Olearia muelleri, Westringia rigida* and *Grevillea acuaria*. Isolated areas with an additional mid-story of open mallee shrubland 3-10m of *Allocasuarina helmsii.*				
Landscape Position	**Species Richness**	**Area (% of total survey area)**	**Number of Relevés**	**All species in Community**
Shallow stony soils on upper slopes	25	102.1 ha (11.55%)	3	*Acacia erinacea* *Acacia tetragonophylla* *Allocasuarina helmsii* *Alyxia buxifolia* *Atriplex nummularia* *Atriplex vesicaria* *Casuarina pauper* *Cratystylis conocephala* *Dodonaea lobulata* *Dodonaea stenozyga* *Eremophila glabra* subsp. *glabra* *Eremophila parvifolia* *Eremophila* sp. *Eucalyptus clelandiorum* *Eremophila oldfieldii* *Eucalyptus griffithsii* *Eucalyptus torquata* *Exocarpos aphyllus* *Grevillea acuaria* *Maireana sedifolia* *Olearia muelleri* *Santalum acuminatum* *Senna artemisioides subsp. filifolia* *Scaevola spinescens* *Westringia rigida*
 Photo: C1R2				

Table G. 2: Community 1 Details: *Eucalyptus clelandiorum* (Cleland's Blackbutt) Mallee woodland

NVIS Description				
Mallee woodland <10m (to forest 10-30m) of *E. clelandiorum* over sparse mallee shrubland 3-10m of *Melaleuca sheathiana, Exocarpos aphyllus* and *Eremophila* sp. over sparse heathland 1-2m of *Senna artemisioides* subsp. *filifolia, Atriplex nummularia* and *Scaevola spinescens.*				
Landscape Position	**Species Richness**	**Area (% of total survey area)**	**Number of Relevés**	**All species in Community**
Greenstone midslopes and some drainage areas.	28	73.5 ha (8.3%)	3	*Atriplex vesicaria* *Acacia erinacea* *Atriplex nummularia* *Beyeria ?sulcata* *Cratystylis conocephala* *Dodonaea lobulata* *Eremophila interstans* subsp. *interstans* *Eremophila oldfieldii* *Eremophila scoparia* *Eremophila* sp. *Eremophila* sp. *Eremophila parvifolia* subsp. *auricampi* *Eucalyptus Campaspe* *Eucalyptus clelandiorum* *Eucalyptus griffithsii* *Eucalyptus torquata* *Exocarpos aphyllus* *Maireana radiata* *Maireana* sp. *Maireana triptera* *Melaleuca hamata* *Melaleuca sheathiana* *Myoporum* sp. *Olearia muelleri* *Phebalium* sp. *Scaevola spinescens* *Senna artemisioides* subsp. *filifolia* *Westringia rigida*

Photo: C2R3

Table G. 3: Community 3 Details: *Eucalyptus griffithsii* Mallee Woodland, *E. torquata absent*

NVS Description				
Mallee Woodland <10m of *E. griffithsii* and *Eucalyptus clelandiorum* over open mallee shrubland <3m of *Eremophila ?interstans* subsp. *interstans, Eremophila* spp. and *Exocarpos aphyllus*, over open heathland 1-2m of S*enna artemisioides* subsp. *filifolia, Atriplex nummularia, Acacia erinacea* and *Westringia rigida*, over heathland <1m of S*caevola spinescens, Dodonaea lobulata* and *Olearia muelleri.*				
Landscape Position	**Species Richness**	**Area (% of total survey area)**	**Number of Relevés**	**All species in Community**
Drainage lines	35	65.8 ha (7.4)	5	*Acacia acuminata* *Acacia erinacea* *Acacia hemiteles* *Alyxia buxifolia* *Atriplex nummularia* *Atriplex* sp. *Atriplex vesicaria* *Austrostipa* sp. *Cratystylis conocephala* *Dianella revoluta* *Dodonaea lobulata* *Dodonaea stenozyga* *Eremophila ?decipiens* *Eremophila glabra* subsp. *glabra* *Eremophila interstans* subsp. *interstans* *Eremophila* *Eremophila parvifolia* *Eremophila parvifolia* subsp. *auricampi* *Eremophila oldfieldii* *Eremophila scoparia* *?Eragrostis* sp. *Eucalyptus clelandiorum* *Eucalyptus griffithsii* *Exocarpos aphyllus* *Lycium australe* *Maireana pyramidata* *Maireana sedifolia* *Maireana* sp. *Maireana triptera* *Olearia muelleri* *Santalum acuminatum* *Scaevola spinescens* *Sclerolaena diacantha* *Senna artemisioides* subsp. *filifolia* *Solanum lasiophyllum* *Vincetoxicum lineare*
 Photo: C3R3				

Table G. 4: Community 1 Details: *Acacia* spp. and *Allocasuarina* spp. Mallee Shrubland

NVS Description				
Mallee shrubland <10m of *Acacia acuminata, Acacia collegialis, Grevillea acuaria* and *Allocasuarina acutivalvis* subsp. *acutivalvis* over open heathland 1-2m of *Eremophila linearis, Senna artemisioides* subsp. *filifolia* and *Scaevola spinescens* over open heathland <1m of *Dodonaea microzyga.*				
Landscape Position	**Species Richness**	**Area (% of total survey area)**	**Number of Relevés**	**All species in Community**
Lateritic ridges	27	6.9ha (0.8)	3	*Acacia acuminata* *Acacia collegialis* *Acacia websteri* (P1) (C4R2) *Allocasuarina acutivalvis* subsp. *acutivalvis* *Allocasuarina campestris* *Alyxia buxifolia* *Cratystylis conocephala* *Cryptandra aridicola* *Dodonaea microzyga* *Eremophila gibbosa* *Eremophila linearis* *Eremophila oppositifolia* *Eremophila* sp. *Eucalyptus torquata* *Euryomyrtus maidenii* *Grevillea acuaria* *Hakea ?platysperma* *Olearia muelleri* *Phebalium* sp. *Prostanthera grylloana* *Santalum acuminatum* *Scaevola spinescens,* *Sclerolaena diacantha* *Senna artemisioides* subsp. *filifolia* *Solanum lasiophyllum* *Triodia tomentosa* *Vincetoxicum lineare*
 Photo: C4R2				

Table G. 5: Community 1 Details: *Eucalyptus campaspe* (Silver-topped gimlet) Mallee Woodland

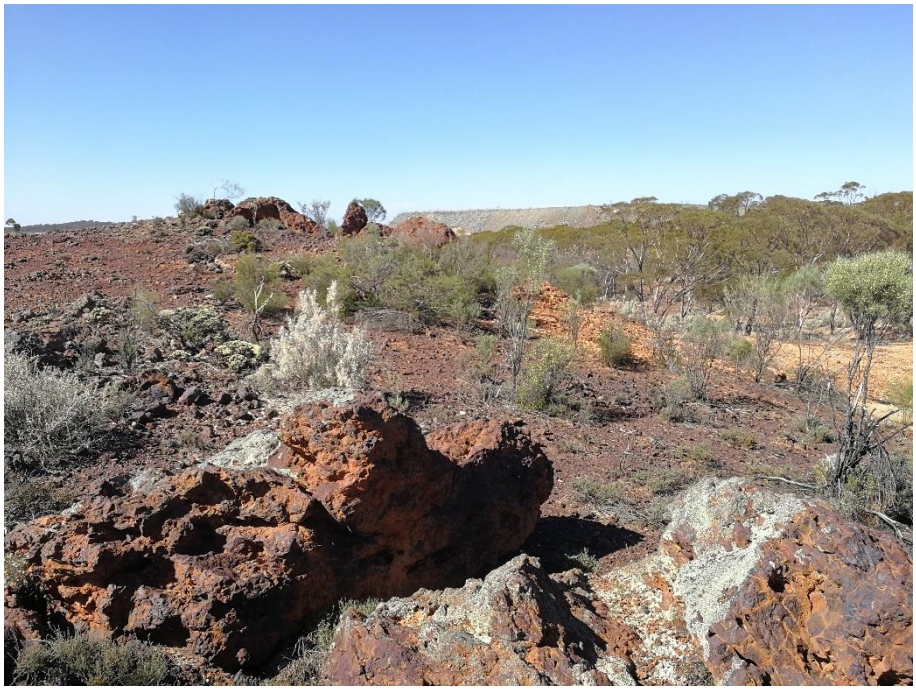
<table>
<tr><th colspan="5">NVS Description</th></tr>
<tr><td colspan="5">Mallee woodland <10m of E. campaspe and E. celastroides over sparse mallee shrubland <3m of Eremophila interstans subsp. interstans, Eremophila oppositifolia over sparse heathland 1-2m of Atriplex nummularia and Scaevola spinescens over sparse heathland <1m of Atriplex vesicaria, Dodonaea lobulata and Westringia rigida.</td></tr>
<tr><th>Landscape Position</th><th>Species Richness</th><th>Area (% of total survey area)</th><th>Number of Relevés</th><th>All species in Community</th></tr>
<tr><td>Greenstone midslopes, occasionally drainage areas.</td><td>20</td><td>128.2ha (14.5%)</td><td>3</td><td rowspan="2">Acacia excentrica
Acacia multispicata
Alyxia buxifolia
Atriplex nummularia
Atriplex vesicaria
Dodonaea lobulata
Eucalyptus campaspe
Eucalyptus celastroides
Enchylaena tomentosa var. tomentosa
Eremophila glabra subsp. glabra
Eremophila interstans subsp. interstans
Eremophila oppositifolia
Maireana sedifolia
Maireana triptera
Olearia muelleri
Ptilotus obovatus
Salsola australis
Santalum acuminatum
Scaevola spinescens
Sclerolaena diacantha</td></tr>
<tr><td colspan="4">
Photo: C5R1</td></tr>
</table>

Table G. 6: Community 1 Details: *Eucalyptus salmonophloia* (Salmon gum) Open Woodland

NVS Description				
Open woodland 10-30m of *E. salmonophloia* over sparse heathland 1-2m of *Atriplex nummularia* over sparse heathland <1m of *Atriplex vesicaria* and *Maireana* sp.				
Landscape Position	**Species Richness**	**Area (% of total survey area)**	**Number of Relevés**	**All species in Community**
Flats, low lying deep soils	17	173.0ha (19.6%)	3	*Atriplex nummularia* *Atriplex* sp. *Atriplex vesicaria* *E. campaspe* *E. salmonophloia* *E. transcontinentalis* *Enchylaena tomentosa* var. *tomentosa* *Eremophila glabra* subsp. *glabra* *Exocarpos aphyllus* *Grevillea acuaria* *Maireana sp.* *Maireana triptera* *Olearia muelleri* *Scaevola spinescens* *Sclerolaena diacantha* *Senna artemisioides* subsp. *filifolia* *Solanum lasiophyllum*

Photo: C6R1

Table G. 7: Community 1 Details: *Eremophila oppositifolia* Heathland on Mesa

NVS Description				
Isolated heathland 1-2m of *Eremophila oppositifolia* over sparse heathland <1m of *Dodonaea microzyga, Ptilotus helichrysoides, Atriplex vesicaria* and *Rhagodia spinescens.*				
Landscape Position	**Species Richness**	**Area (% of total survey area)**	**Number of Relevés**	**All species in Community**
Small ironstone mesa	17	0.6 ha (0.1%)	1	*Acacia erinacea* *Atriplex nummularia* *Atriplex vesicaria* *Cratystylis conocephala* *Dodonaea lobulata* *Dodonaea microzyga* *Eremophila oppositifolia* *Frankenia fecunda* *Isotoma petraea* *Maireana triptera* *Olearia muelleri* *Ptilotus helichrysoides* *Rhagodia spinescens* *Rytidosperma acerosum* *Scaevola spinescens* *Solanum lasiophyllum* *Vincetoxicum lineare*
 **Photo: C7R1**				

Targeted Flora Search for *Acacia websteri* (Priority 1)

Addendum Report to Terratree (2020) Targeted Flora and Vegetation Survey - Coolgardie Gold Project [ref: T20040]

Prepared for Focus Minerals

Ref: T21015

ecological assessment & management

Document Control

Revision	Details	Date	Author	Reviewer
Rev 0	Draft for Internal Review	28/06/2021	H. Legge	J. Grehan
Rev A	Draft for Submission to Client	06/07/2021	H. Legge	G. Blick
Rev B	Final report	21/08/2021	H. Legge	G. Blick

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Abbreviations and Acronyms

BAM Act	*Biosecurity and Agriculture Management Act 2007*
BC Act	*Biodiversity Conservation Act 2016*
BoM	Bureau of Meteorology
C4	Community four (Terratree 2020)
DBCA	Department of Biodiversity, Conservation and Attractions, WA Government
DER	former Department of Environment Regulation (now DWER), WA Government
DPIRD	Department of Primary Industries and Regional Development, WA Government
DWER	Department of Water and Environmental Regulation, WA Government
EPA	Environmental Protection Authority, WA Government
EP Act	*Environment Protection Act 1986*
GDA94	Geocentric Datum Australia 1994
GPS	Global Positioning System
WoNS	Weed of National Significance

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Executive Summary

In 2020 Focus Minerals Ltd (Focus) commissioned Terratree Pty Ltd (Terratree) to undertake a Targeted flora and vegetation survey within their Coolgardie Gold Project area (Terratree 2020). The objective of the survey was to determine the presence of Threatened and Priority Flora and other species of conservation significance and Threatened and Priority Ecological Communities within the project area.

The Targeted flora and vegetation survey consisted of a desktop assessment followed by a field survey in November 2020. One Priority species, *Acacia websteri* (P1) was recorded during the survey in 2020. The specimen was identified after the field survey and a follow-up Targeted search was therefore required in areas of suitable habitat to determine the exact location and extent of this species within the survey area.

Focus commissioned Terratree to undertake this targeted search for *Acacia websteri* (P1) in early 2021 in areas of suitable vegetation communities within the Coolgardie Gold Project survey area. This report is an addendum to the Terratree (2020) Targeted flora and vegetation survey report and presents the results of the Targeted search for *Acacia websteri* conducted in April 2021. Further environmental and regulatory contextual information can be found in the Terratree (2020) full survey report. The results of these surveys will inform future exploration programmes and associated environmental approval applications.

Prior to the field search, a review of the Terratree (2020) survey report, spatial data and aerial imagery was undertaken to locate key areas to concentrate the field search. The planned Targeted search areas totalled 12.9 ha and comprised of the associated acacia-dominated vegetation community and an area of proposed exploration drilling.

The 2021 Targeted flora search was conducted in accordance with the Environmental Protection Authority's (EPA) *Technical Guidance for Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016b) and applied in conjunction with the *Environmental Factor Guideline for Flora and Vegetation* (EPA 2016a), between the 27th and 29th of April 2021 by Senior Ecologist Heather Legge and Senior Taxonomist/Botanist Kathya Tippur of Terratree.

All areas of Community 4 were searched as they were observed on-ground. An additional area of Community 3, a *Eucalyptus griffithsii* Mallee Woodland, associated with drainage lines was also searched due to the presence of a tall shrub understory and proximity to the recorded *Acacia websteri.* In total, an area of 19.73 ha was thoroughly searched.

Targeted search areas were traversed on foot in corridors of a maximum of 25m. When *Acacia websteri* (P1) was recorded, surrounding areas were also traversed. Other notable species, such as Weeds of National Significance (WoNS), were also recorded.

Field data was collected using hand-held GPS units (GDA 94) to an accuracy of 3 m. Locations of individuals and populations of *Acacia websteri* (P1) were later digitised using QGIS 3.10 (QGIS Development team 2021). Photographs were also taken of any recorded *Acacia websteri* (P1) and surrounding habitat. There were no significant limitations to the Targeted search.

Acacia websteri (P1) could be observed and identified in the field, however, specimens were still collected for confirmation. In addition, in cases where any other potential Threatened or Priority Flora could not be identified in the field, these were also collected for subsequent identification at the WA Herbarium by Senior Botanist-Taxonomist, Kathya Tippur.

Three individuals of the Targeted species, *Acacia websteri* (P1) were recorded on the western edge of the survey area, near Nepean Rd. No *Acacia websteri* was recorded in the proposed exploration drilling area or any other search areas. As a priority 1 species, impacts to *Acacia websteri* (P1) should be avoided.

No other non-Targeted Threatened or Priority native flora species were recorded in during the search.

One significant introduced species, *Cylindropuntia tunicata* (Hudson Pear)*,* was recorded in the vicinity of the *Acacia websteri,* near Nepean Rd. *Cylindropuntia tunicata,* is a Weed of National Significance (WoNS) and is also listed under the BAM Act as a Declared Pest s22(2) Control Category 3 (Restricted) throughout Western Australia (DPIRD 2021).

Control measures are required for a Declared Pest s22(2) (C3 Restricted) (DPIRD 2019) and therefore must be implemented for *Cylindropuntia tunicata.* National best practice control manuals have been developed for invasive *Opuntioid* cacti in Australia, which can be downloaded from the DPIRD website (DPIRD 2017), and these should be referred to when developing and implementing control measures.

Terratree makes the following recommendations:

- Avoid impacts to the three individuals of *Acacia websteri* (P1) by applying an adequate buffer to surrounding native vegetation
- Develop and implement a hygiene management plan to prevent the introduction and spread of introduced flora and pathogens, especially *Opuntioid* cacti
- Conduct weed eradication and control measures for WoNS and Declared Pest species recorded, *Cylindropuntia tunicata* (Hudson Pear).

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1 Introduction

1.1 Background

In 2020 Focus Minerals Ltd (Focus) commissioned Terratree Pty Ltd (Terratree) to undertake a Targeted flora and vegetation survey within their Coolgardie Gold Project area (Terratree 2020). The objective of the survey was to determine the presence of Threatened and Priority Flora and other species of conservation significance and Threatened and Priority Ecological Communities within the project area.

The Targeted flora and vegetation survey consisted of a desktop assessment followed by a field survey in November 2020 conducted in accordance with the Environmental Protection Authority's (EPA) *Technical Guidance for Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016b) applied in conjunction with the *Environmental Factor Guideline for Flora and Vegetation* (EPA 2016a).

One Priority species, *Acacia websteri* (P1) was recorded during the survey in 2020. The specimen was identified after the field survey and a follow-up Targeted search was therefore required in areas of suitable habitat to determine the exact location and extent of this species within the survey area.

Focus commissioned Terratree to undertake this targeted search for *Acacia websteri* in early 2021 in areas of suitable vegetation communities within the Coolgardie Gold Project survey area. This report is an addendum to the Terratree (2020) Targeted flora and vegetation survey report and presents the results of the Targeted search for *Acacia websteri* conducted in April 2021. Further environmental and regulatory contextual information can be found in the Terratree (2020) full survey report.

The results of these surveys will inform future exploration programmes and associated environmental approval applications.

1.2 Scope of Work

The scope of work for the project included the following:

- Undertake a thorough Targeted flora field search for *Acacia websteri* (P1) within suitable vegetation communities.
- Opportunistically search for *Acacia websteri* (P1) and other conservation significant flora or weeds within the broader CGP 2020 survey area.
- Produce an inventory of the numbers of and locations of *Acacia websteri* (P1) individuals and populations within these areas.
- Produced figures showing the location of *Acacia websteri* (P1) and any other Threatened or Priority Flora if present and provide spatial data (.shp, GDA 94).

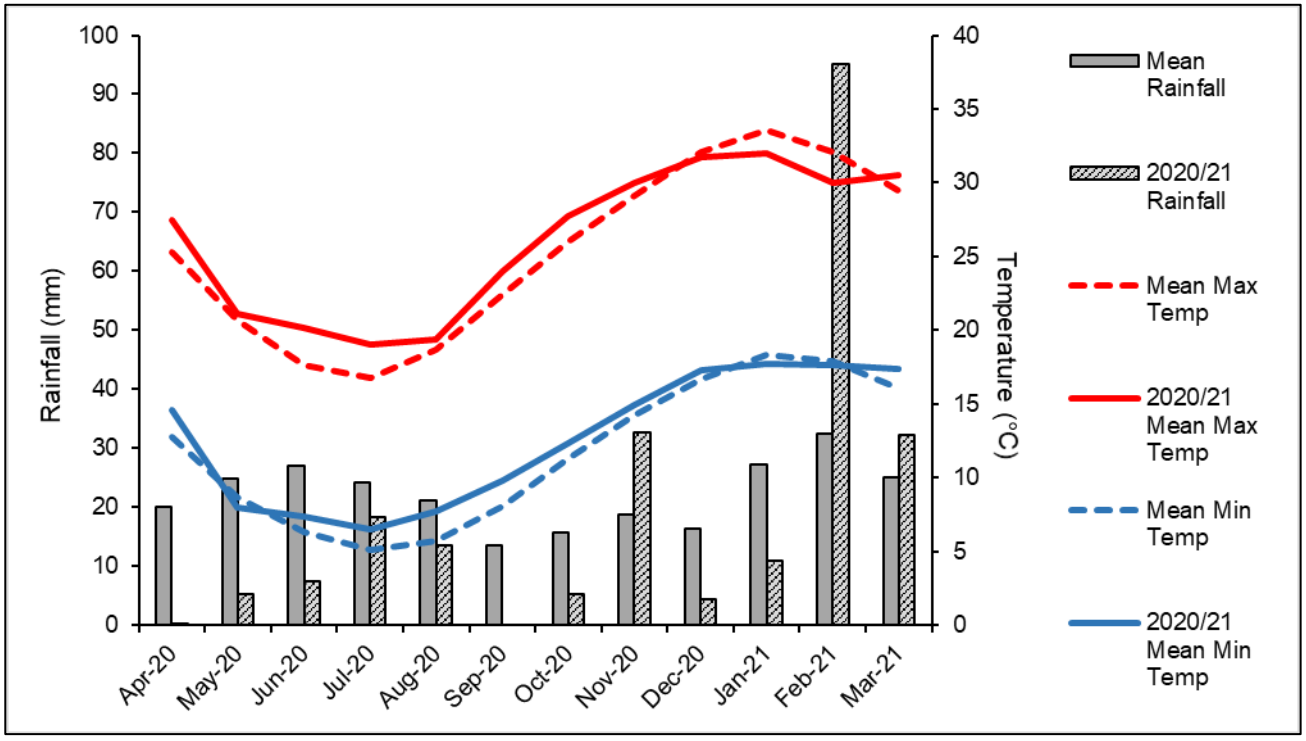
- Prepare an addendum report detailing the methods and results of the search.

1.3 Climate Preceding the Search

Weather data has been obtained from the Kalgoorlie-Boulder Airport BoM weather station (no. 12038), 33.3km away. Although closer to the survey area, the Coolgardie weather station lacks data from recent years.

Temperature and rainfall data recorded at this weather station in the 12 months prior to the survey compared with long term averages are shown in **Graph 1**. Monthly mean temperatures were close to, although generally, slightly higher than long-term mean records. In the twelve months preceding the survey, the area received 225mm rainfall, which is close to but below the long-term average annual rainfall of 265mm.

Most months were drier or much drier than average except for February, which received 95.2mm rainfall, which is significantly higher than the 32.4mm long term mean. November and March also received slightly higher than average rainfall. Climate was not considered a limitation to the search.



Graph 1: Rainfall and temperature data for Kalgoorlie-Boulder Airport weather station no. 12038 (BoM 2021).

2 Methods

2.1 Desktop Review

An extensive desktop assessment was conducted as part of the 2020 Targeted flora and vegetation survey, and therefore, not required for this Targeted search (Terratree 2020). Prior to the field search, a review of the Terratree (2020) survey report, spatial data and aerial imagery was undertaken to locate key areas to concentrate the field search.

The Desktop review determined the key areas to concentrate the Targeted search totalling 12.9 ha. The planned Targeted search areas comprised of the associated vegetation community and an area of proposed exploration drilling. **Figure 1a** presents an overview of the proposed Targeted search area.

The Terratree (2020) survey found that the survey area is dominated by Eucalypt Mallee Woodlands and Open Woodlands with small areas of Mallee Shrublands and one Isolated Eremophila Heathland. Seven distinct communities were observed within the survey area. The Priority species, *Acacia websteri* (P1), was recorded in Community 4, relevé C4R2, on the western edge of the survey area, near Nepean Rd. Therefore, beginning at relevé C4R2, all areas of Community 4 would be the focus of the Targeted search. Community 4 is described in accordance with NVIS Structural Formation Terminology (NVIS TWG 2017) as:

> "Mallee shrubland <10m of *Acacia acuminata, Acacia collegialis, Grevillea acuaria* and *Allocasuarina acutivalvis* subsp. *acutivalvis* over open heathland 1-2m of *Eremophila linearis, Senna artemisioides* subsp. *filifolia* and *Scaevola spinescens* over open heathland <1m of *Dodonaea microzyga* ()*"* (Terratree 2020).

Community 4 was expected to occupy three pockets associated with lateritic soils totalling 6.9 ha. These three areas in the south, central and north of the study area are shown in **Figure b**, **Figure c** and **Figure d**, respectively. Further details about Community 4 are provided in **Appendix A.**

Focus advised Terratree of eight proposed exploration drill sites and their access tracks, the nearest of which is located approximately 125 metres (m) from relevé C4R2. These proposed drill sites were added to the planned search area in addition to Community 4. Applying a buffer of 50 m to the drill sites and a 25 m buffer to access tracks, produced a total drill site search area of 5.86 ha. The planned drill site search area is shown in **Figure c**.

2.2 Targeted Field Search

The Targeted flora search was conducted in accordance with the Environmental Protection Authority's (EPA) *Technical Guidance for Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016b)

(hereafter referred to as the 'EPA Guidance') and applied in conjunction with the *Environmental Factor Guideline for Flora and Vegetation* (EPA 2016a).

The EPA guidance recommends follow up searches be conducted in Autumn (EPA 2016b). However, *Acacia websteri* (P1) has distinctive features on the phyllodes and can be identified by close examination of the phyllodes, without the need for flowers or fruit. This allows flexibility of timing of this targeted search.

The Targeted flora search for *Acacia websteri* (P1) was conducted between the 27th and 29th of April 2021 by Senior Ecologist Heather Legge and Senior Taxonomist/Botanist Kathya Tippur of Terratree.

Acacia websteri (P1) could be observed and identified in the field, however, specimens were still collected for confirmation. In addition, in cases where any other potential Threatened or Priority Flora could not be identified in the field, these were also collected for identification. These specimens were labelled, pressed, dried and frozen according to the WA Herbarium requirements. Their identification was subsequently confirmed by Senior Botanist-Taxonomist, Kathya Tippur by comparing collections with pressed specimens housed at the herbarium and using taxonomic keys and other reference materials.

Beginning at C4R2, all key search areas were traversed on foot in corridors of a maximum of 25m. When *Acacia websteri* (P1) was recorded, surrounding areas were also traversed. Other notable species, such as Weeds of National Significance (WoNS), were also recorded.

Field data was collected using hand-held GPS units (GDA 94) to an accuracy of 3 m. Locations of individuals and populations of *Acacia websteri* (P1) were later digitised using QGIS 3.10 (QGIS Development team 2021). Photographs were also taken of any recorded *Acacia websteri* (P1) and surrounding habitat.

All areas of Community 4 were searched as they were observed on-ground, which was slightly different to how they had been mapped over aerial imagery, with lower intensity ground-truthing in the previous survey. An additional area of Community 3, a *Eucalyptus griffithsii* Mallee Woodland, associated with drainage lines was also searched. Despite the understory being dominated by *Eremophila* spp. rather than *Acacia* spp. this area was included due to the presence of a tall shrub understory and proximity to the recorded *Acacia websteri* (**Figure c**). The actual area thoroughly covered during the Targeted search is shown against the planned search areas in **Figure 1a**, **Figure b**, **Figure c** and **Figure d**. In total, an area of 19.73 ha was thoroughly searched.

EPA Guidance outlines potential survey limitations (EPA 2016b). There were no significant limitations to the Targeted search.

3 Results

3.1 Targeted Species - *Acacia websteri* (Priority 1)

Three individuals of the targeted species, *Acacia websteri* (P1) were recorded on the western edge of the survey area, near Nepean Rd. No *Acacia websteri* was recorded in the proposed exploration drilling area or other search areas. The location of the recorded *Acacia websteri* is shown in **Figure** . Details including the GPS location and reference to photos of these three individuals are listed in **Table 1**.

All three individuals of *Acacia websteri* found during the search were located near C4R2 and were associated with Community 4.

Table 1: Location of *Acacia websteri (P1)*

Specimen ID	Species	Status	GPS Location		Location Description	Photo Reference
			EASTING	NORTHING		
FM01	*Acacia websteri*	P1	324704.53	6572509.37	Adjacent to the powerline track on the north side.	**Photo 1**
FM02	*Acacia websteri*	P1	324704.72	6572462.81	16 m South of track	**Photo 2**
FM05	*Acacia websteri*	P1	324705.94	6572458.84	Alongside FM02	**Photo 3**

3.2 Other Significant Flora - *Cylindropuntia tunicata* (WoNS and Declared Pest s22(2) C3)

No other non-targeted Threatened or Priority native flora species were recorded in during the search.

One significant introduced species, *Cylindropuntia tunicata* (Hudson Pear), was recorded near Nepean Rd. Although known to occur within 10 km of the search area (DBCA 2020a), this species was not previously recorded in the survey area in the 2020 survey or previous surveys (Terratree 2020). A single patch of several individuals of *Cylindropuntia tunicata* was recorded approximately 40 m east-south-east of the FM01 *Acacia websteri* and just over 50m north-east of FM02 and FM05, as shown in **Figure** and **Photo 4**. Details of this species' weed status and recorded location are provided in **Table 2**.

Cylindropuntia tunicata is a densely branched cactus that grows up to 1.5m tall and 3m wide, cylindrical stem segments up to 25 centimetres (cm), densely covered with pale spines 3-6 cm long. Fruit are sterile, and the stem segments detach easily, and the plant spreads vegetatively (Weeds of Australia 2021). *Cylindropuntia tunicata* is Weed of National Significance (WoNS), also listed under the BAM Act as a Declared Pest s22(2) Control Category 3 (Restricted) throughout Western Australia and is an Environmental weed (DPIRD 2021).

Dense infestations of *Cylindropuntia tunicata* impact native biodiversity in semi-arid areas by displacing native flora. Spines may cause serious injury to humans, livestock and native fauna (Weeds of Australia 2021).

Table 2: Details of significant introduced flora recorded during the search.

Species	Common Name	National Status	WA Status	GPS Location		Location Description
				EASTING	NORTHING	
Cylindropuntia tunicata	Hudson Pear	WoNS	Declared Pest (s22(2) (C3 – Restricted)	324745.31	6572499.18	Approximately 40m ESE of FM01

4 Discussion

4.1 Targeted Species - *Acacia websteri* (Priority 1)

Acacia websteri (P1) is a shrub with yellow flowers and fibrous bark growing 1.2 to 5m in red sand, loam or clay in low-lying areas and flats (WA Herbarium 2021). Three individuals of the Targeted species, *Acacia websteri* (P1) were recorded on the western edge of the survey area, near Nepean Rd. These three individuals of *Acacia websteri* were located, as expected, near C4R2 and none were recorded in other search areas. As anticipated, the *Acacia websteri* were associated with Community 4. No *Acacia websteri* was recorded in the nearby *Eremophila* spp. dominated Community 3, which was searched due to the presence of a dense shrub layer and proximity to the recorded occurrences of *Acacia websteri*. Likewise, no *Acacia websteri* was recorded in the proposed exploration drilling area, which is covered by different vegetation communities.

The Department of Biodiversity Conservation and Attractions (DBCA) enforces regulations under the *Biodiversity Conservation Act* (BC Act) 2015 to conserve Priority flora in WA. Priority flora are those species considered by DBCA to be poorly known, uncommon or under threat but for which there is insufficient justification, based on known distribution and population sizes, for inclusion as Threatened species under the BC Act. The categories for Threatened and Priority species and Ecological Communities give an indication of the priority for undertaking further surveys based on the number of known sites and degree of threat to those populations. The Priority 1 listing of *Acacia websteri* indicates that this species in urgent need of further study.

Priority 1 species are those which 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" (DBCA 2019).

Acacia websteri (P1) is known to occur in 50 records in WA in the central southern inland areas from Bencubbin to Coolgardie-Kalgoorlie areas from the (DBCA 2020a). Most of these known occurrences are found around Coolgardie. There are four records of *Acacia websteri* as close as 250 m away from the Targeted search area (DBCA 2020b).

Under the *Environmental Protection Act* EP Act (1986), all clearing of native vegetation requires a clearing permit unless an exemption applies. Generally, clearing is not permitted where biodiversity values would be significantly negatively impacted (DER 2014). Applications for clearing permits are assessed under 10 Clearing

principles. Principle (a) is “Native vegetation should not be cleared if it comprises a high level of biological diversity” (DER 2014). Priority flora are a measure of biodiversity values considered under this principle. If present, they indicate potentially higher biodiversity that would normally be expected in an area, therefore worthy of protection (DER 2014).

4.2 Other Significant Flora - *Cylindropuntia tunicata* (WoNS and Declared Pest s22(2) C3)

No other non-Targeted Threatened or Priority native flora species were recorded in during the search.

One significant introduced species, *Cylindropuntia tunicata,* was recorded in the vicinity of the *Acacia websteri,* near Nepean Rd.

Commonly known as Hudson Pear, *Cylindropuntia tunicata* is a member of the highly invasive cacti group, *Opuntioid* cacti. *Cylindropuntia tunicata* was found in the Desktop search for the 2020 survey as occurring within 10 km of the survey area (DBCA 2020a). Although one *Opuntioid* cacti, *Opuntia stricta* (Prickly Pear) was recorded during the Terratree (2020) survey, *Cylindropuntia tunicata,* was not found during the previous survey.

Dense infestations of *Cylindropuntia tunicata* impact native biodiversity in semi-arid areas by displacing native flora and long spines may cause serious injury to native fauna (Weeds of Australia 2021). Humans and livestock can also be harmed, and the plant presents an economic threat. Almost all *Opuntioid* cacti are listed as WoNS and Declared Pests in Australia. *Cylindropuntia tunicata,* is a Weed of National Significance (WoNS) and is also listed under the BAM Act as a Declared Pest s22(2) Control Category 3 (Restricted) throughout Western Australia (DPIRD 2021).

At a national level, there are just 32 weed species listed as WoNS (DAWE2021). These are plants that have been selected for their invasiveness and impact characteristics, potential and current area of spread and their primary industry, environmental and socioeconomic impacts. Many Weeds of National Significance are also Declared pests under the BAM Act in WA. Land managers must implement control measures in areas infested with Declared plants in the C3 category (DPIRD 2019). Given the proximity of *Cylindropuntia tunicata* to *Acacia websteri*, just 40 m management is more crucial.

The C3 control category requires that;

> “Organisms that should have some form of management applied that will alleviate the harmful impact of the organism, reduce the numbers or distribution of the organism or prevent or contain the spread of the organism” (DPIRD 2021).

Management requirements for areas infested with Declared pest species in Category 3 (C3) are as follows:

- "The infested area must be managed in such a way that alleviates the impact, reduces the number or distribution or prevents or contains the spread of the declared pest in this area
- Ensure that any person conducting an activity on the land is aware that measures are required to be taken to control the declared pest" (DPIRD 2019a).

DPIRD (2019a) recommends that land managers:

- "Treat to destroy all plants, prevent seed set and prevent the spread of seed or plant parts within and from the area on or vehicles and/or machinery prior to seed set each year
- Erect a biosecurity sign for persons conducting any activity on the land."

National best practice control manuals have been developed for *Opuntioid* cacti in Australia (DPIRD 2017). Physical removal (care to take all parts) and strategic herbicide application are the best forms of control.

The distribution of *Cylindropuntia tunicata* weed is still restricted to the Eastern Goldfields, specifically the Coolgardie region (WA Herbarium), and caution should be taken to prevent further spread. The fruit of *Cylindropuntia tunicata* is sterile, and the plants spread vegetatively, meaning stem segments detach easily and grow roots upon contact with soil (Weeds of Australia 2021). Therefore, as well as management to eradicate *Cylindropuntia tunicata,* it is critical to implement biosecurity to prevent its spread. When activities are undertaken in this area, it is important to stay on established tracks and undertake vehicle and footwear hygiene checks before moving to new areas.

5 Conclusions and Recommendations

Three individuals of the Targeted species, *Acacia websteri* (P1) were recorded on the western edge of the survey area, near Nepean Rd. No *Acacia websteri* was recorded in the proposed exploration drilling area or any other search areas. As a priority 1 species, impacts to *Acacia websteri* (P1) should be avoided.

No other non-Targeted Threatened or Priority native flora species were recorded in during the search.

One significant introduced species, *Cylindropuntia tunicata* (Hudson Pear)*,* was recorded in the vicinity of the *Acacia websteri,* near Nepean Rd. *Cylindropuntia tunicata,* is a Weed of National Significance (WoNS) and is also listed under the BAM Act as a Declared Pest s22(2) Control Category 3 (Restricted) throughout Western Australia (DPIRD 2021).

Control measures are required for a Declared Pest s22(2) (C3 Restricted) (DPIRD 2019) and therefore must be implemented for *Cylindropuntia tunicata.* National best practice control manuals have been developed for invasive *Opuntioid* cacti in Australia, which can be downloaded from the DPIRD website (DPIRD 2017), and these should be referred to when developing and implementing control measures.

Terratree makes the following recommendations:

- Avoid impacts to the three individuals of *Acacia websteri* (P1) by applying an adequate buffer to surrounding native vegetation
- Develop and implement a hygiene management plan to prevent the introduction and spread of introduced flora and pathogens, especially *Opuntioid* cacti
- Conduct weed eradication and control measures for WoNS and Declared Pest species recorded, *Cylindropuntia tunicata* (Hudson Pear).

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Photos

Photo 1: Targeted Priority 1 species found during the search, *Acacia websteri* (P1) specimen FM01.

Photo 2: Targeted Priority 1 species found during the search *Acacia websteri* (P1) specimen FM02.

Photo 3: Targeted Priority 1 species found during the search *Acacia websteri* (P1) specimen FM05.

Photo 4: *Cylindropuntia tunicata* (Hudson Pear) (WoNS and Declared Pest s22(2)-C- Restricted) found during the search.

Figures

Figure 1a: Search Area Overview

NOTE: Terratree Pty Ltd does not guarantee that this figure is without any mistakes and disclaims all liability for any error, loss or other consequence that may arise from any of the spatial information illustrated.
Spatial information in this figure is based on observable vegetation made during the field survey component of the assessment.

322000 324000 326000 328000 330000

6578000 6576000 6574000 6572000 6570000

Jaurdi Hills Rd
Coolgardie North Rd
Great Eastern Hwy
Lindsays Gold Access Rd
Great Eastern Hwy
Toorak St
Ford St
Great Eastern Hwy
Gnarlbine Rd
Victoria Rock Rd
Nepean Rd
Arizona St
Ladyloch Rd
Coolgardie Esperance Hwy
Ladyloch Rd
Southern Bypass Rd
Tindals Rd
Victoria Rock Rd
Nepean Rd

Legend

- Target Area - Releve C4R2
- Actual *Acacia websteri* (P1) Targeted Search Area (April 2021)
- Planned Search Area - Expected Acacia Community (C4)
- Planned Additional Search Area - Proposed Drill Areas
- Proposed Drill Access
- Targeted Flora and Vegetation Survey Area (Nov 2020)

Overview

Focus Minerals Coolgardie

***Acacia websteri* Targeted Search Area Overview**

0 1 2 km

N

Datum: GDA 1994
Projection: MGA Zone 51

Scale: 1: 30 000 at A3

Date: 29 June 2021	Prepared: H. Legge	Project No: T21015
Expiry:	Checked: J. Grehan	
Figure 1a	Revision:	
	Review:	

Terratree

Figure 1b: Search Area – South

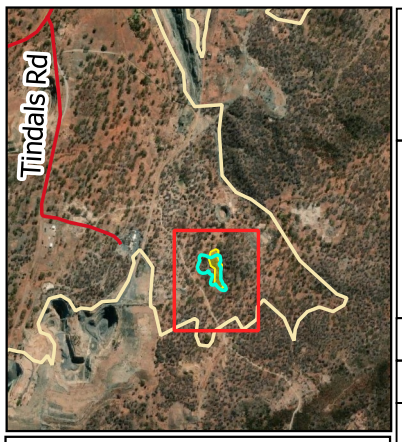
NOTE: Terratree Pty Ltd does not guarantee that this figure is without any mistakes and disclaims all liability for any error, loss or other consequence that may arise from any of the spatial information illustrated.
Spatial information in this figure is based on observable vegetation made during the field survey component of the assessment.

326400 326500 326600 326700 326800 326900

6571100 6571000 6570900 6570800 6570700 6570600 6570500

Legend

- Actual *Acacia websteri* (P1) Targeted S□□r□□ Area (April 2021)
- Planned Search Area - Expected Acacia Community (C4)
- Targeted Flora and Vegetation Survey Area (Nov 2020)



Overview

Focus Minerals Coolgardie

***Acacia websteri* Targeted Search Area South**

0 50 100 m

N

Datum: GDA 1994
Projection: MGA Zone 51

Scale: 1: 2 000 at A3

Date: 24 June 2021	Prepared: H. Legge	Project No: T21015
Expiry:	Checked: J. Grehan	
Figure 1b	Revision:	
	Review:	

Terratree

Figure 1c: Search Area – Central

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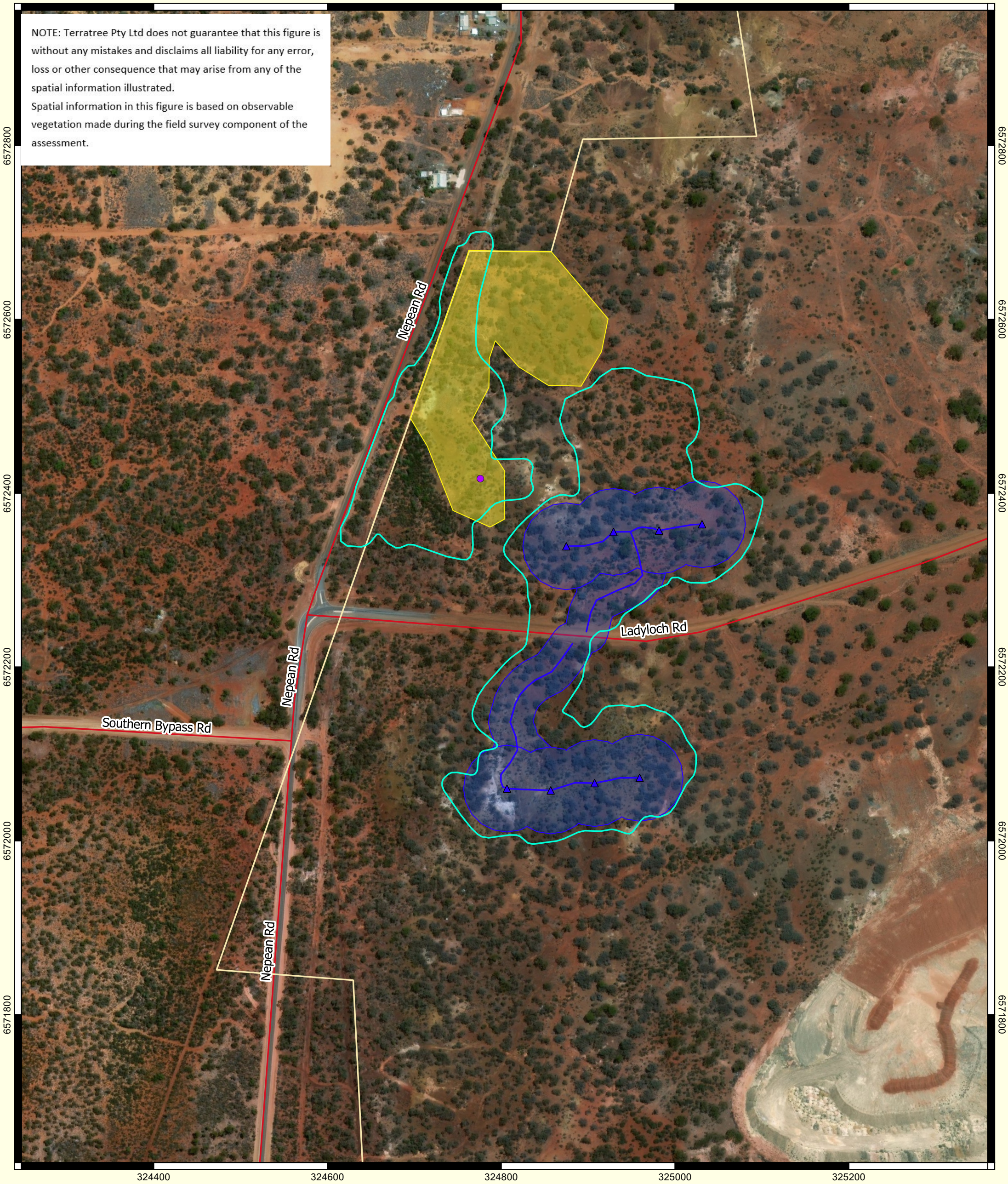
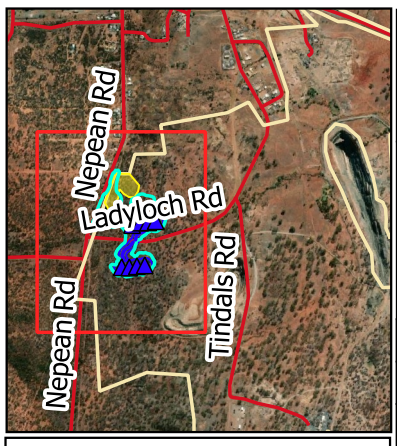


Legend

- Actual *Acacia websteri* (P1) Targeted Search Area (April 2021)
- Target Area - Releve C4R2
- Planned Search Area - Expected Acacia Community (C4)
- Planned Additional Search Area - Proposed Drill Areas
- Proposed Drill Access
- Proposed Drill Site
- Targeted Flora and Vegetation Survey Area (Nov 2020)



Overview

Focus Minerals Coolgardie

***Acacia websteri* Targeted Search Area Central**

0 50 100 m

N

Datum: GDA 1994
Projection: MGA Zone 51

Scale: 1: 4 000 at A3

Date: 29 June 2021	Prepared: H. Legge	Project No: T21015
Expiry:	Checked: J. Grehan	
Figure 1c	Revision:	
	Review:	

Terratree

Figure 1d: Search Area – North

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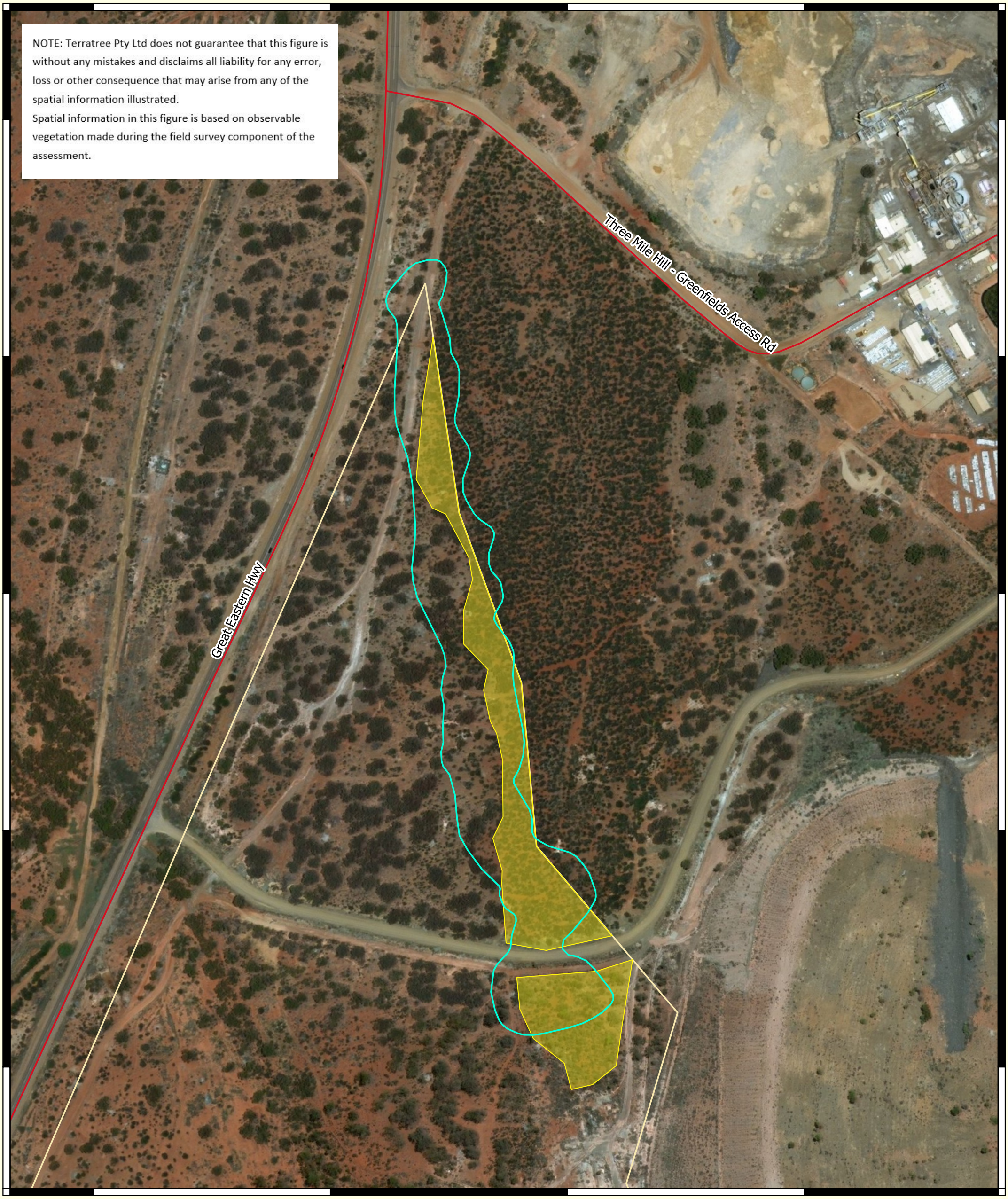
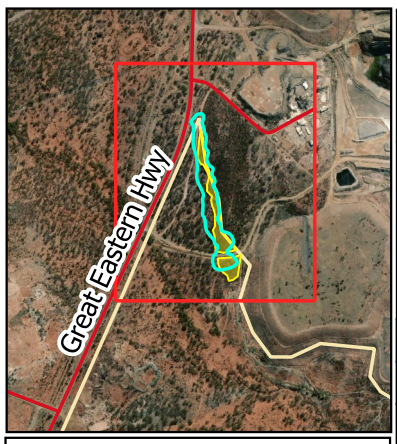
Spatial information in this figure is based on observable vegetation made during the field survey component of the assessment.



Legend

- Actual *Acacia websteri* (P1) Targeted Search Area (April 2021)
- Planned Search Area - Expected Acacia Community (C4)
- Targeted Flora and Vegetation Survey Area (Nov 2020)



Overview

Focus Minerals Coolgardie

***Acacia websteri* Targeted Search Area North**

0 50 100 m

N

Datum: GDA 1994
Projection: MGA Zone 51

Scale: 1: 3 000 at A3

Date: 24 June 2021	Prepared: H. Legge	Project No: T21015
Expiry:	Checked: J. Grehan	
Figure 1d	Revision:	
	Review:	

Terratree

Figure 2: Targeted Search Results - *Acacia websteri* (P1) and WoNS Location

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Spatial information in this figure is based on observable vegetation made during the field survey component of the assessment.

FM01
FM02
FM05
Nepean Rd
Ladyloch Rd

Legend

- *Acacia websteri* (Priority 1)
- **Cylindropuntia tunicata* (WoNS)
- Proposed Drill Access
- Proposed Drill Site
- Targeted Flora and Vegetation Survey Area (Nov 2020)

Overview

Focus Minerals Coolgardie

Targeted Search Results
***Acacia websteri* & WoNS Locations**

0 50 100 m

N

Datum: GDA 1994
Projection: MGA Zone 51

Scale: 1: 1500 at A3

Date: 24 June 2021	Prepared: H. Legge	Project No: T21015
Expiry:	Checked: J. Grehan	
Figure 2	Revision:	Terratree
	Review:	

Appendices

Appendix A: Vegetation Community 4 Detailed Descriptions

Table A.1: Community 4 Details: *Acacia* spp. and *Allocasuarina* spp. Mallee Shrubland

<table>
<tr><th colspan="5">NVS Description</th></tr>
<tr><td colspan="5">Mallee shrubland <10m of Acacia acuminata, Acacia collegialis, Grevillea acuaria and Allocasuarina acutivalvis subsp. acutivalvis over open heathland 1-2m of Eremophila linearis, Senna artemisioides subsp. filifolia and Scaevola spinescens over open heathland <1m of Dodonaea microzyga.</td></tr>
<tr><th>Landscape Position</th><th>Species Richness</th><th>Area (% of total survey area)</th><th>Number of Relevés</th><th>All species in Community</th></tr>
<tr><td>Lateritic ridges</td><td>27</td><td>6.9ha (0.8)</td><td>3</td><td rowspan="2">Acacia acuminata
Acacia collegialis
Acacia websteri (P1) (C4R2)
Allocasuarina acutivalvis subsp. acutivalvis
Allocasuarina campestris
Alyxia buxifolia
Cratystylis conocephala
Cryptandra aridicola
Dodonaea microzyga
Eremophila gibbosa
Eremophila linearis
Eremophila oppositifolia
Eremophila sp.
Eucalyptus torquata
Euryomyrtus maidenii
Grevillea acuaria
Hakea ?platysperma
Olearia muelleri
Phebalium sp.
Prostanthera grylloana
Santalum acuminatum
Scaevola spinescens,
Sclerolaena diacantha
Senna artemisioides subsp. filifolia
Solanum lasiophyllum
Triodia tomentosa
Vincetoxicum lineare</td></tr>
<tr><td colspan="4">
Photo: C4R2</td></tr>
</table>

Basic Fauna Survey and Malleefowl Assessment

South Coolgardie Project

Prepared for Focus Minerals

November 2024

Limitations

Scope of services

This report ("the report") has been prepared by Western Ecological Pty Ltd (WE) in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and WE. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

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In preparing the report, WE have relied upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise expressly stated in the report, WE have not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. WE have also not attempted to determine whether any material matter has been omitted from the data. WE will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented, or otherwise not fully disclosed to WE. The making of any assumption does not imply that WE have made any enquiry to verify the correctness of that assumption.

The report is based on conditions encountered and information received at the time of preparation of this report or the time that site investigations were carried out. WE disclaim responsibility for any changes that may have occurred after this time. This report and any legal issues arising from it are governed by and construed in accordance with the law of Western Australia as at the date of this report.

Report Version	Revision No.	Purpose	Author / Reviewer	Submitted to Client	
				Form	Date
Report	1	For client review	Western Ecological / Focus Minerals	Electronic	04/11//2024
Final Report	2	Final Report	Western Ecological	Electronic	13/1/2024

Executive Summary

Focus Minerals Limited (Focus) commissioned Western Ecological (WE) to undertake a basic fauna survey and Malleefowl habitat assessment in the Coolgardie area approximately 35 km southwest of Kalgoorlie in Western Australia.

Western Ecological understands that Focus is exploring feasible options within the surveyed area of 310 hectares, approximately 5 km south-east of Coolgardie called the South Coolgardie Project. Consequently, Focus requested a basic fauna survey be undertaken in the area, and a determination of the presence of threatened fauna species based on habitats present. The outcome of the survey undertaken by WE and the information supplied in this report will be used to inform the environmental assessment and approvals process.

The desktop assessment involved searches of the DBCA Threatened Fauna Database, the EPBC Protected Matters Search Tool (EPBC PMST) and the Atlas of Living Australia (ALA). Results of the databases searches returned the following:

- DBCA – 191 records in total, of 18 threatened vertebrate fauna species. Comprised of 16 bird species and two mammal species.
- EPBC PMST – 16 threatened species (11 of which are migratory/marine species).
- ALA - 423 vertebrate fauna species (10 amphibian species, 106 reptile species, 266 bird species and 41 mammal species).

A total of 27 threatened fauna species were identified during the desktop review of the database searches. These were comprised of 25 bird species and two mammal species.

A field survey was undertaken on October 2nd and 3rd 2024. A total of 25 habitat assessments were undertaken during the field survey and a total of four fauna habitat types were recorded. These four habitats were Mixed Eucalyptus Woodland, Salmon Gum Woodland, Acacia Shrubland and Drainage Area. The most widespread habitat across the survey area was Mixed Eucalyptus Woodland, comprising 59.3% of the survey area. A total of 30 fauna species were recorded in the survey area. All fauna species recorded are considered relatively common and widespread

The primary threatened fauna species to consider during the survey was the Malleefowl. The survey area lacked suitable Malleefowl breeding habitat, however Malleefowl could forage throughout the entire survey area. During the survey no Malleefowl, or mounds were recorded.

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1. Introduction

1.1 Background

Focus Minerals Limited (Focus) commissioned Western Ecological (WE) to undertake a basic fauna survey and Malleefowl habitat assessment in the Coolgardie area approximately 35 km west of Kalgoorlie in Western Australia.

Western Ecological understands that Focus is exploring feasible options within the surveyed area of 310 hectares, approximately 5 km south-east of Coolgardie called the South Coolgardie Project (Figure 1). Consequently, Focus requested a basic fauna survey and Malleefowl habitat assessment, be undertaken in the area, and a determination of the presence of threatened fauna species based on habitats present (the focus being the Malleefowl). The results of the survey will support the environmental approvals process for the project.

1.2 Scope

The scope to be undertaken was as follows:

- Basic fauna survey and a Malleefowl habitat assessment
- Document the above in a technical fauna report.

1.3 Objective

The objective of the fauna survey was to define the fauna values in the survey area, to support future project planning, and inform environmental approvals.

Figure 1: Project Location

0 0.5 1 1.5 km

GDA2020 - MGA Zone 51

Legend

Survey Area

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Ref: 245_002_RevA.qgz

1.4 Legislative Context

Fauna in Western Australia (WA) is protected formally and informally by various legislative and non-legislative measures, which are as follows:

- Legislative Protection:
  - *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
  - *Western Australian Biodiversity Conservation Act 2016* (BC Act).
- Non-legislative measures:
  - WA Department of Biodiversity, Conservation and Attractions (DBCA) Priority lists
  - Recognition of locally significant populations by DBCA.

A short description of each is given below. Other definitions, including species conservation categories, are provided in Appendix 1.

EPBC Act

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) aims to protect matters of national environmental significance, which are detailed in Appendix 1. Under the EPBC Act, the Commonwealth Department of Department of Climate Change, Energy, the Environment and Water (DCCEEW) lists protected species and Threatened Ecological Communities (TECs) by criteria set out in the Act. Species are conservation significant if they are listed as Threatened (i.e., Critically Endangered, Endangered and Vulnerable) or Migratory.

Bird species protected as Migratory under the EPBC Act include those listed under international migratory bird agreements relating to the protection of birds, which migrate between Australia and other countries, for which Australia has agreed. This includes the Japan-Australia Migratory Bird Agreement (JAMBA), the China-Australia Migratory Bird Agreement (CAMBA), the Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA) and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

Some marine fauna or terrestrial fauna that use marine habitats are listed as Marine under the EPBC Act. These species are only considered conservation significant when a proposed development occurs in a Commonwealth marine area (i.e., any Commonwealth Waters or Commonwealth Marine Protected Area). Outside of such areas, the EPBC Act does not consider these species to be matters of national environmental significance, so are not protected under the Act.

BC Act

The *Biodiversity Conservation Act 2016* (BC Act) replaced both the *Wildlife Conservation Act 1950* and the *Sandalwood Act 1929* and came into effect on 1 January 2019. The aim of the Act is to conserve and protect biodiversity and to promote the ecologically sustainable use of biodiversity components in the State and will bring more activities within the scope of biodiversity laws.

Taxa listed as Threatened in the category of critically endangered, endangered, or vulnerable under section 19 (1a, 1b, and 1c), or is a rediscovered species to be regarded as threatened species under section 26 (2) of the BC Act. Other categories include extinct or extinct in the wild and they are listed under section 23 (1) of the BC Act (Appendix 1).

If species meet 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, they are covered under section 13 (1) of the BC Act and are called specially protected species. Species that are listed as threatened species (critically endangered, endangered, or vulnerable) or extinct species under the BC Act can't also be listed as Specially Protected species (see Appendix 1 for a more detailed description of each threat category).

Threatened Ecological Communities (TECs) are also covered under the BC Act and are placed into three categories of critically endangered, endangered, or vulnerable under section 27 (1a, 1b, and 1c) of the BC Act depending on their threat status.

DBCA Priority Species and Communities

DBCA lists species that are possibly threatened but that do not meet criteria for listing under the BC Act, or are otherwise data deficient, and adds them 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. Consideration 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 (see Appendix 1 for more detail of the priority codes).

The DBCA also has a list of Priority Ecological Communities (PECs) that have scant information available to be considered a TEC, or which are rare but not currently threatened. Ecological communities that do not meet survey criteria or that are not sufficiently defined are added to the PEC list under priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community, and evaluation of conservation status, so that consideration can be given to their declaration as a TEC. Ecological communities that are adequately known, and are rare but not threatened or meet criteria for near threatened, or that have been recently removed from the threatened list, are placed in priority 4. These ecological communities require regular monitoring. Conservation dependent ecological communities are placed in priority 5.

Informal Recognition of Threatened Fauna

Certain populations or communities of fauna may be of local significance or interest because of their patterns of distribution and abundance. For example, fauna may be locally significant because they are range extensions to the previously known distribution or are newly discovered species (and have the potential to be of conservation significance). In addition, many species are in decline as a result of threatening processes (land clearing, grazing, and changed fire regimes) and relict populations of such species assume local importance for DBCA. It is not uncommon for DBCA to make comment on these species of interest.

2. Existing Environment

2.1 Bioregions

The Biogeographic Regionalisation of Australia (IBRA7) divides Australia into 89 bioregions based on major biological, geographical and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (DCCEEW 2024a). The survey area sits within the Coolgardie 3 subregion (COO3 – Eastern Goldfields subregion) which forms part of the Coolgardie Bioregion, of which there are three subregions (Figure 2).

The climate is Arid to Semi-arid with 200-300 mm of rainfall, sometimes in summer but usually in winter. Coolgardie 3 lies on the Yilgarn Craton's 'Eastern Goldfields Terrains'. The relief is limited and consists of gently undulating plains interrupted in the west with low hills and ridges of Archaean greenstones and in the east by a horst of Proterozoic basic granulite (Cowan 2001). The underlying geology is of gneisses and granites eroded into a flat plane covered with tertiary soils and with scattered exposures of bedrock. Calcareous earths are the dominant soil group and cover much of the plains and greenstone areas. A series of large playa lakes in the western half are the remnants of an ancient major drainage line (Cowan 2001).

The vegetation consists of Mallees, Acacia thickets and shrub heaths on sandplains. Diverse Eucalyptus woodlands occur around salt lakes, on ranges, and in valleys. Salt lakes support dwarf shrublands of samphire. Woodlands and Dodonaea shrubland occur on basic granulites of the Fraser Range. The area is rich in endemic Acacias. Land use consists primarily of Crown reserves, grazing, conservation and mining (Cowan 2001).

323548
327806
6577399
6573142
6568885
Jaurdi Hills Rd
Coolgardie North Rd
Great Eastern Hwy
Coolgardie
Great Eastern Hwy
Coolgardie Esperance Hwy

Figure 2: IBRA

0 0.5 1 1.5 km

GDA2020 - MGA Zone 51

Legend

Survey Area

IBRA Sub Region: Eastern Goldfield

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Ref: 245_003_RevA.qgz

2.2 Climate

The nearest Bureau of Meteorology (BoM) weather station, with up to date (2024 data) is Kalgoorlie – Boulder Airport (Station No. 012038) which is approximately 35 km north-east of the survey area. A weather station was present at Coolgardie; however, it has incomplete rainfall records, particularly from 2010 onwards. Further to this temperature data is only available from 1897 to 1953 (BoM 2024).

The annual long-term average (1939 – 2024) rainfall is 263.4 mm, with the lowest average monthly rainfall being 13.4 mm in September, while the highest average monthly rainfall is 31.7 mm in February (BoM 2024). The mean annual monthly maximum temperature recorded at the Kalgoorlie – Boulder Airport weather station is 25.4°C and annual monthly minimum is 11.8°C. On average the warmest month of the year is January with a mean maximum temperature of 33.7°C. July is the coolest month with a mean maximum temperature of 16.9°C.

The mean maximum temperature for the 12 months prior to the survey (October 2023 - September 2024) was 26.5^{0}C and the minimum was 12.9^{0}C. These temperatures are relatively consistent with the long-term average. The total rainfall in the 12 months prior to the survey was 284 mm (Figure 3), which is also relatively consistent with the annual long-term average total (22.6 mm less).

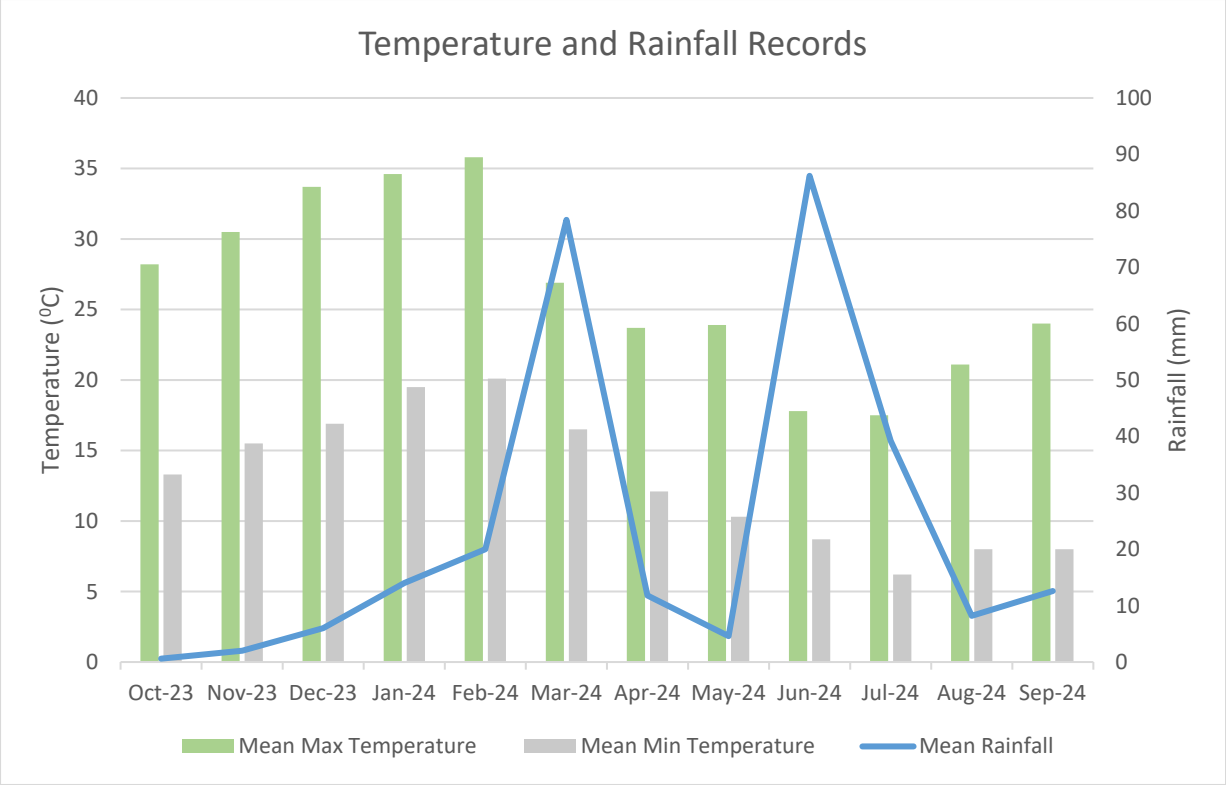


Figure 3. Climate Graph. Mean temperatures and rainfall (from October 2023 – September 2024) data per month from Kalgoorlie-Boulder Airport Station (BoM 2024).

2.3 Previous Surveys

The following table provides a summary of a number of fauna surveys that have been undertaken in the vicinity of the survey area. Please note, WE have undertaken five surveys for Focus in the overall Coolgardie Gold Project (2021, 2023, 2024). Reports were reviewed for information relevant to the survey area and the threatened fauna species covered in this report. Previous reports include the following:

Table 1: Previous fauna surveys undertaken for the vicinity of the survey area.

Reference	Survey Type	Date	Proximity to survey area	Methods	Broad Habitats Described	Threatened Fauna Recorded
Patricia Jean Pit Project. (Western Ecological 2024)	Basic fauna, targeted Malleefowl survey	Sept 2024	Approx. 6 km to the north	Basic fauna survey (habitat assessment, opportunistic observations), targeted assessment	Mixed Eucalyptus Woodland, Rocky Ridge, Acacia Shrubland	Potentially active Malleefowl mound (tbc Dec 2024)
Targeted Malleefowl Survey – Bonnievale. (Western Ecological 2023)	Targeted Malleefowl Survey	July 2023	Approx. 3.5 km to the north	Walked Transects	Salmon Gum Woodand Acacia Shrubland Casuarina Shrubland	None
Basic Fauna Survey – Bonnievale Pipeline Corridor. Western Ecological 2023)	Basic Fauna Survey	July 2023	Approx. 3.5 km to the north	Basic fauna survey (habitat assessment, opportunistic observations)	Salmon Gum Woodland Eucalyptus Woodland	None
Coolgardie Gold Project - Kangaroo Hill Timber Reserve (KHTR), Basic Fauna Survey. (Western Ecological 2023)	Basic Terrestrial Fauna Survey	May 2023	KHTR - Approx. 16 km to the south-west. Bonnievale – approx. 5km to the north	Basic fauna survey (habitat assessment, opportunistic observations), targeted assessment	Mallee Eucalyptus Woodland Salmon Gum Woodland Acacia Shrubland Casuarina Shrubland	None
Coolgardie Gold Project, Basic Fauna Survey. (Western Ecological 2021)	Basic Terrestrial Fauna Survey	Feb 2021	Approx. 5km to the south-east	Basic fauna survey (habitat assessment and opportunistic observations) and targeted assessment	Mallee Eucalyptus Woodland Salmon Gum Woodland Acacia Shrubland Drainage Line	None
Bonnievale Level 1 Fauna Assessment (Kingfisher Environmental Consulting 2017)	Basic Terrestrial Fauna Survey	May 2017	Approx. 5km to the north	Basic fauna survey. Targeted searches. Camera traps. Bat detectors	Mallee Eucalyptus Woodland Acacia Shrubland Allocasuarina Shrubland	Malleefowl (individual and mounds)
Mt Marion Fauna Assessment: Hamptons Lease Area 53. (Bamford Consulting Ecologists 2022)	Basic and targeted fauna survey	Jan 2022	Approx. 25 km to the south-east	Basic fauna survey Targeted searches Camera traps.	Mixed Eucalypt Woodland Acacia Shrubland Dense Mallee and Eucalypt woodland	Malleefowl (mounds)
Spectrum Ecology and Spatial (2022) Binduli South Project Terrestrial Fauna and SRE Assessment	Basic fauna survey	2022	Approx. 20 km to the north-east	Basic fauna survey (habitat assessment and opportunistic observations)	Mixed Eucalypt Woodland Acacia Shrubland Allocasuarina Shrubland Chenopod Shrubland	None

3. Methods

3.1 Requirements for Fauna Surveys

The fauna survey was completed in accordance with the following Environmental Protection Authority (EPA) and DCCEEW requirements for the environmental surveying and reporting of fauna surveys in WA, where relevant and practical, and as documented in:

- EPA Technical Guidance: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA 2020)
- Survey Guidelines for Australia's Threatened Birds. EPBC Act survey guidelines 6.2 (2010) (DSEWPaC)
- Survey Guidelines for Australia's Threatened Mammals. EPBC Act survey guidelines 6.5 (2011) (DSEWPaC)
- Survey Guidelines for Australia's Threatened Reptiles. EPBC Act survey guidelines 6.6 (2011) (DSEWPaC)
- Survey Guidelines for Australia's Threatened Frogs. EPBC Act survey guidelines 6.3 (2010) (DSEWPaC)
- National Recovery Plan for Malleefowl (*Leipoa ocellata)* (DCCEEW 2024b)
- National Malleefowl Monitoring Manual. (National Malleefowl Recovery Team 2020)
- Threatened Species Scientific Committee. Conservation Advice, where provided for species listed under the EPBC Act (DCCEEW)
- DBCA standard fauna operating procedures (where relevant).

3.2 Desktop Assessment

Searches of the DBCA Threatened Fauna Database, EPBC Protected Matters Search Tool (EPBC PMST) and the Atlas of Living Australia (ALA) (with a 70 km buffer applied) were undertaken to identify fauna species of conservation significance potentially occurring in the survey area (DBCA 2024, DCCEEW 2024c, ALA 2024) (Appendix 2). These searches were centred on the following co-ordinates 325950 m E / 6573958 m S.

3.3 Field Survey

The field survey was undertaken on October 2nd and 3rd 2024, by two qualified Zoologists (Dr Ron Firth and Laura Stevens). As per the scope and proposal, the following survey methods were undertaken.

3.3.1 Habitat Assessment

Habitat assessments were undertaken to assess their potential to support threatened fauna species and the quality of habitat they provide to a wider suite of fauna. Fauna habitat assessments were undertaken to define and delineate the main broad fauna habitat types present. The habitat assessments were documented systematically for each habitat type on standardised field sheets. The habitat assessments consisted of the following:

- location of the broad habitat type within the survey area (GPS co-ordinate) and its relative percentage
- habitat condition was assessed at each assessment site as 'completely degraded' through to 'pristine', based on the scale given in Keighery (1994)
- landscape position
- dominant vegetation and structure (e.g., number of vegetation strata)
- hollow-bearing trees and dead stags (e.g., average size and abundance of hollows)
- description of any rock and rocky outcrops, logs (e.g., abundance and size), substrate (e.g., leaf litter)
- wetlands, creeks, rivers, dams and other water bodies
- description of any observed nests and roosts (if present)
- subterranean roosts (e.g., caves, disused mineshafts and/or adits)
- associated fauna species observed using the habitat
- disturbance (e.g., cattle grazing, fire)
- photo showing a typical example of the broad habitat type.

3.3.2 Bird Surveys

Systematic bird surveys were undertaken in all habitats in the survey area for 20 minutes in a 1-ha quadrat. They were undertaken during typical peak periods of activity when birds are calling and moving about, which is typically in the 3-4 hours of sunrise, particularly during warmer periods.

3.3.3 Opportunistic Searches

Fauna were recorded opportunistically during the survey. This involved looking through leaf litter (particularly under the Eucalyptus trees, where a layer of leaf litter had sometimes formed), overturning rocks and looking under decorticating bark (where present). Other recordings included visual sightings of active fauna such as reptiles and birds, signs of species presence such as burrows and scats of mammals and reptiles, and aural observations of amphibian and bird species. Observation (visual or heard) of species considered threatened were recorded by means of a hand-held GPS if present.

3.3.4 Malleefowl Habitat Assessment

Due to our extensive experience and knowledge of fauna in the region and local Coolgardie area, a threatened fauna species considered during the field survey was the Malleefowl (*Leipoa ocellata),* which is listed as Vulnerable (Vu) under the EPBC Act and BC Act. The habitat assessment for the Malleefowl was undertaken in areas containing suitable habitat, which were assessed for evidence of Malleefowl activity, recorded as:

- Malleefowl tracks
- Malleefowl nesting mounds including status (inactive/ active) and activity according to the following criteria:
  - Nest in preparation – eggs not laid (evidence of litter trail)
  - Mound is in progress/ maintenance – eggs assumed to be laid
  - Evidence of chicks leaving nest – chicks fledging site / shell fragments
  - Decommissioned – spreading and returning of mound soil
- In addition, the following information was recorded:
  - Mound size/dimensions/profile (Table 2)
  - GPS co-ordinates
  - Surface crust of mound
  - Evidence of shell fragments, feathers, scats, rakings, scrapes, tracks, presence of lerps (Psyllids)
- Malleefowl individual sightings and assessment of age (chick/ adult)
- Opportunistic observations of Malleefowl evidence (tracks, mounds and or individual sightings) within the survey area.

The National Malleefowl Monitoring Guide (2020) was used to assist in assessing breeding activity at any potential Malleefowl mounds observed during the Malleefowl habitat assessment. The following profiles were considered when judging age and timeframe with regard to activity of mounds (Table 2):

Table 2: Malleefowl mound profiles and definitions.

Malleefowl Mound Profile	Mound Definition
	1. Typical crater with raised rim This is the typical shape of an inactive (dormant) mound.
	2. Mound fully dug out The crater slopes down steeply and at the base the sides drop vertically to form a box-like structure with sides usually 20-30cm deep. Often litter will have been raked into windrows and may have started to enter the mound.

	3. Mound with litter This is the next stage after Profile 2. Litter will have been raked into the mound by Malleefowl, and thick layers of litter are evident on the surface. There may or may not be some sand mixed with the litter at this stage.
	4. Mound mounded up (no crater) An active but unopened Malleefowl mound.
	5. Mound that has a sandy crater with peak in centre An active mound which is in the process of being closed by Malleefowl.
	6. Mound low and flat without peak or crater A very long unused mound

3.3.5 Taxonomy

For species identified in the desktop assessment, where there is doubt to their true taxonomy (through subsequent name changes or taxonomic reviews), an effort was made to determine the current scientific name for each taxon. In some cases, old scientific names were presented where correct nomenclature could not be determined due to name changes. Some taxon names may be followed by 'sp.', meaning that the species name was not given in the data source, or the identification is in doubt. Where there are previously recorded taxa such as this that have the potential to be a threatened fauna species, they are discussed specifically in the results and discussion sections.

Taxonomy and nomenclature in this report follows the accepted listing of published terrestrial vertebrate species, primarily the West Australian (WA) Museum (2024). In addition, the following are also considered; the listing for amphibians and reptiles is consistent with Wilson & Swan (2023), Chapple *et al.* (2019), and (to a lesser extent) Cogger (2018); bird listings are consistent with Christidis & Boles (2008) and mammal listings are consistent with Baker & Gynther (2023) and to a lesser extent Woinarski *et. al*. (2014).

4 Results

4.1 Survey Limitations

Survey constraints are often difficult to predict, as is the extent to which they influence survey effort. Survey limitations and constraints of the fauna survey are outlined below in Table 3.

Table 3: Limitations and constraints associated with the survey.

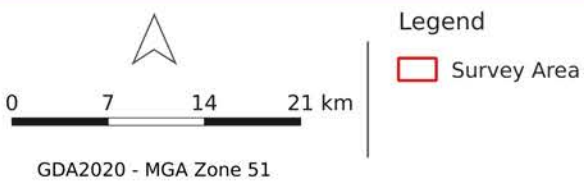
Potential Limitation or Constraint	Impact on Survey	Comment
Access	None	The survey area (approximately 310 ha) was accessible and traversed by vehicle and by foot.
Experience	None	The personnel who undertook the survey were practitioners suitably qualified in their respective fields with relevant experience as specified by the EPA Technical Guidance: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA 2020). The personnel were as follows: • Dr Ron Firth (Principal Ecologist) • Laura Stevens (Principal Zoologist).
Timing, weather, season	None	The survey was conducted as a basic fauna survey and targeted Malleefowl survey and is therefore primarily about defining and describing habitats present (with particular reference to potential Malleefowl habitat). Timing, weather and season, therefore, are not deemed a prime consideration. The survey was undertaken on October 2nd and 3rd 2024. There were therefore no limitations to the survey due to timing, weather or season.
Scope	None	The survey consisted of a basic fauna and targeted Malleefowl survey. During the field survey, the entire survey area was assessed to define the habitats and fauna values in the survey area.
Completeness	None	A total of: • 310 ha was assessed during the basic fauna and targeted Malleefowl survey • 25 habitat assessment were undertaken • 30 fauna species were recorded in the survey area • No threatened fauna species were recorded in the survey area • Four fauna habitat types were described
Disturbance	Moderate	Disturbance from mining and exploration activities was evident in a number of locations in the survey area.

4.2 Database Results

Results of the databases searches can be seen in Appendix 2 and Figure 4. The following records were present in the database search results:

- DBCA – 191 records in total - 18 threatened vertebrate fauna species, comprised of 16 bird species and two mammal species.
- EPBC PMST – 16 threatened species (11 of which are migratory/marine species).
- ALA - 423 vertebrate fauna species (10 amphibian species, 106 reptile species, 266 bird species and 41 mammal species).

Figure 4: Threatened Fauna Records (DBCA)



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The DBCA threatened fauna database returned a total of 18 threatened fauna species within a 70 km radius of survey area. The results of which can be seen in Figure 4. There are no records of threatened fauna within the survey area. The closest record of a threatened fauna species is approximately 2 km to the south of the survey area – one Malleefowl, which was recorded between Burra Rocks Road and Coolgardie-Esperance Road. The record is classed as moderately certain and is from 2015. A total of 126 records of the Malleefowl were recorded within the 70 km buffer of the survey area. These records will be covered in more detail in the discussion in section 5.1.

Shorebirds and Waterbirds

A total of 17 waterbird species were returned in the databases. These were a combination of waders/shorebirds and migratory birds. These wetland avifauna such as wading birds, including Sandpipers, Stints and Sanderlings inhabit estuaries, mudflats, saltmarshes, sandflats and beaches, with shallow water edges, where they feed on invertebrates such as worms, molluscs, insects and crustaceans (Garnett *et al.* 2011, Garnett & Baker 2021). Suitable habitat for these shorebird and waterbird species is not present in the survey area, therefore they have been omitted from any further discussion.

Now regionally extinct

A number of species in the database searches were also known to be historical records of species now locally extinct, or species with a single and old records for example) the Chuditch (*Dasyurus geoffroii*), which had a single record from 1974 and the Central Long-eared Bat (*Nyctophilus major tor*), which had a single record from 1981. These species have therefore been omitted from further discussion.

Database errors and anomalies

Occasionally there are errors and/or anomalies in the database searches that are sourced from the various government departments, for example, the Grey Wagtail (*Motacilla cinerea*), which is a rare visitor (Johnstone & Storr 1998) and the Grey Falcon (*Falco hypoleucos*), whose distribution is to the east of the survey area (Garnett & Baker 2021, Slater *et al*. 2017). These species have been omitted from any further discussion.

It is important to note, that the EPBC PMST is not entirely based on point records, but also on broader information, including bioclimatic distribution models, whereas the DBCA threatened fauna database and NatureMap is. Consequently, the results of the EPBC PMST are in some cases less accurate, particularly at a local scale (e.g., the Night Parrot [*Pezoporus occidentalis*]). As a result, the EPBC PMST can include species that do not occur in the survey area because, for example, there is no habitat available, or they are now known to be locally extinct. These species have therefore been omitted from any further discussion.

In addition, many fauna are not distributed evenly across the landscape, are more abundant in some places than others, and consequently more detectable (Currie 2007). Furthermore, some small, common ground-dwelling reptile and mammal species tend to be habitat specific, and many bird species can occur as regular migrants, occasional visitors, or vagrants. Therefore, all these species have been excluded from any further discussion.

Conservation Significant Fauna

With the aforementioned shorebirds, waterbirds, locally/regionally extinct and database errors species removed, a total of three threatened fauna species retrieved from the database searches are considered as likely or unlikely to occur in the survey area. Of these three threatened fauna species, one species is considered likely and the other two are considered unlikely to occur (Table 4). Each of these species will be discussed in section 5.1 of the discussion below.

The Likelihood of each species is based on the following criteria, (whilst also considering the number and validity of DBCA records for each species):

- Recorded: Recorded during the field survey or site reconnaissance
- Likely: Suitable habitat is present in the survey area and the survey area is in the species' known distribution
- Possible: Limited or no suitable habitat is present in survey area but is nearby. The species has good dispersal abilities and is known from the general area
- Unlikely: No suitable habitat is present in survey area but is nearby, the species has poor dispersal abilities but is known from the general area; or suitable habitat is present, however the survey area is outside of the species' known distribution.

Table 4: Threatened fauna potentially occurring in the survey area.
EN = Listed as Endangered under the EBPC Act/BC Act, VU = Listed as Vulnerable under the EBPC Act/BC Act, OS = Other specially protected species under the BC Act.

Common name	Species name	Conservation Status (EPBC Act)	Conservation Status (WA BC Act)	Likelihood
Birds				
Malleefowl	*Leipoa ocellata*	Vu	Vu	Likely
Carnaby's Black Cockatoo	*Calyptorhynchus latirostris*	En	En	Unlikely
Peregrine Falcon	*Falco peregrinus*		OS	Unlikely

4.3 Field Assessment Results

A total of 30 fauna species were recorded in the survey area. All fauna species recorded are considered relatively common and widespread. Species recorded can be seen in Table 5.

4.3.1 Fauna Assemblage

Amphibians

There are a very limited number of wetland areas and drainage areas in the survey area and in the broader vicinity. A limited number of drainage areas were present in the survey area, however there was no free-standing water present during the survey and no amphibian species were recorded.

Reptiles

During the field survey, two reptile species were recorded. The Sand Goanna (*Varanus gouldii)* which was identified by diggings and tracks and the Dugite was observed basking in the sun.

Birds

During the field survey, 26 bird species were recorded, all of which are considered relatively common and widespread in the region.

Mammals

During the field survey two mammal species were recorded. The Western Grey Kangaroo (*Macropus fuliginosus*) was the only native species. The other (introduced) species was the European Rabbit (*Oryctolagus cuniculus*), which was recorded through scats.

Table 5: Species recorded in the survey area.

Common Name	Species Name	Common Name	Species Name
Australian Magpie	*Gymnorhina tibicen*	Masked Woodswallow	*Artamus personatus*
Australian Raven	*Corvus coronoides*	New-Holland Honeyeater	*Phylidonyris novaehollandiae*
Australian Ringneck	*Barnardius zonarius*	Red Wattlebird	*Anthochaera carunculata*
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	Rufous Whistler	*Pachycephala rufiventris*
Brown Honeyeater	*Lichmera indistincta*	Sand Goanna (diggings/tracks)	*Varanus gouldii*
Chestnut-rumped Thornbill	*Acanthiza uropygialis*	Singing Honeyeater	*Lichenostomus virescens*
Common Bronzewing	*Phaps chalcoptera*	Spiny-cheeked Honeyeater	*Acanthagenys rufogularis*
Crested Bellbird	*Oreoica gutturalis*	Splendid Fairy-wren	*Malurus splendens*

Common Name	Species Name	Common Name	Species Name
Dugite	*Pseudonaja affinis*	Spotted Pardalote	*Pardalotus punctatus*
European Rabbit (scats)	*Oryctolagus cuniculus*	Weebill	*Smicrornis brevirostris*
Galah	*Eolophus roseicapilla*	Western Grey Kangaroo	*Macropus fuliginosus*
Grey Butcherbird	*Cracticus torquatus*	Western Yellow Robin	*Eopsaltria griseogularis*
Grey Currawong	*Strepera versicolor*	White-browed Babbler	*Pomatostomus superciliosus*
Grey Shrike-thrush	*Colluricincla harmonica*	White-cheeked Honeyeater	*Phylidonyris niger*
Hooded Robin	*Melanodryas cucullata*	Willie Wagtail	*Rhipidura leucophrys*

4.4 Fauna Habitat

A total of 25 habitat assessments were undertaken during the field survey, the details of which can be seen in Table 6, Appendix 3 and Figure 5. A total of four fauna habitat types were described in the survey area (excluding degraded areas) and are as follows:

- Mixed Eucalyptus Woodland
- Salmon Gum Woodland
- Acacia Shrubland
- Drainage Area

Table 6: Habitat Assessment Locations

Habitat Assessment	Northing (GDA94)	Easting (GDA94)	Fauna Habitat Type
1	6570570	326996	Mixed Eucalyptus Woodland
2	6571081	327707	Mixed Eucalyptus Woodland
3	6570997	328378	Salmon Gum Woodland
4	6571365	328317	Salmon Gum Woodland
5	6570345	328172	Drainage Area
6	6570014	328032	Drainage Area
7	6569198	325775	Mixed Eucalyptus Woodland
8	6569856	326113	Salmon Gum Woodland
9	6569798	326196	Salmon Gum Woodland
10	6570021	326310	Salmon Gum Woodland
11	6569429	326549	Acacia Shrubland
12	6569430	326595	Acacia Shrubland
13	6569780	326687	Mixed Eucalyptus Woodland
14	6570169	326346	Mixed Eucalyptus Woodland
15	6570063	327406	Acacia Shrubland
16	6569920	327392	Acacia Shrubland
17	6570567	327508	Salmon Gum Woodland
18	6570633	327892	Mixed Eucalyptus Woodland
19	6570203	327234	Mixed Eucalyptus Woodland
20	6569221	326275	Drainage Area
21	6570160	328106	Mixed Eucalyptus Woodland
22	6569698	326950	Mixed Eucalyptus Woodland
23	6569413	327126	Mixed Eucalyptus Woodland
24	6569792	327191	Acacia Shrubland
25	6569913	327089	Acacia Shrubland

Fauna habitat type and extent can be seen in Table 7 and Figure 5. Examples of the fauna habitat types can be seen in Plates 1 – 4.

Table 7: Fauna habitat type, extent and percentage amount.

Fauna Habitat	Extent (ha)	% of survey area
Mixed Eucalyptus Woodland	184	59.3
Salmon Gum Woodland	37.6	12.1
Acacia Shrubland	30.7	9.9
Drainage Area	16.8	5.4
(Degraded)	41.3	13.3
Total	310.4	100

325600 326700 327800

6571400 6570300 6569200

HA1 HA2 HA3 HA4 HA5 HA6 HA7 HA8 HA9 HA10 HA11 HA12 HA13 HA14 HA15 HA16 HA17 HA18 HA19 HA20 HA21 HA22 HA23 HA24 HA25

Figure 5: Fauna Habitat and Fauna Assessment Locations

0 250 500 m

GDA2020 - MGA Zone 51

Legend

Survey Area
Survey Track

Fauna Habitat
Acacia Shrubland
Degraded

Drainage Area
Mixed Eucalyptus Woodland
Salmon Gum Woodland

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Plate 1: Mixed Eucalyptus Woodland.

Mallee Eucalyptus Woodland consisted of mixed eucalypts including *Eucalyptus salmonophloia, E. graffithsii, E. torquate, E. clelandiorum* and *E. campaspe,* over scattered tall shrubs on low stony hill slopes.

Plate 2: Salmon Gum Woodland

Salmon Gum Woodland habitat consisted of scattered *E. salmonophloia* trees over a ground cover of scattered low shrubs on sandy flats.

Plate 3: Acacia Shrubland

Acacia Shrubland habitat consisted of dense mixed Acacia shrubs on rocky hills and slopes.

Plate 4: Drainage Area

Drainage Area consisted of small or minor creek lines with mixed mallee eucalypts and mixed Acacia shrubs.

4.5 Malleefowl Habitat Assessment

No birds, mounds or tracks were recorded in the survey area during this assessment, while walking the survey area on foot and while driving tracks.

The Mixed Eucalyptus Woodland and Salmon Gum Woodland habitats are both unsuitable for Malleefowl breeding habitat. The vegetation in these areas is generally too sparse and so does not provide adequate shelter or cover for mound construction. The substrate in the Mixed Eucalyptus Woodland habitat is generally too rocky or stoney for mound construction, while areas of the Salmon Gum Woodland are too low and flat with evidence of standing water.

The Acacia Shrubland was generally limited to the higher hill slopes, which consisted of rocky substrate and in many places the gradient was too steep for Malleefowl mound construction. A lack of leaf litter was evident in the Acacia Shrubland and throughout much of the Salmon Gum Woodland, which results in a lack of suitable mound-building material.

The Drainage Areas are also unsuitable for Malleefowl mound construction. Although the presence of water in these creek lines is episodic and no water was present at the time the survey was undertaken, Malleefowl do not build mounds in areas where there would be a potential risk of them flooding.

Malleefowl may however use all four habitat types to forage in.

5 Discussion

5.1 Fauna of Conservation Significance

A total of three threatened fauna species retrieved from the database searches are considered as either likely or unlikely to occur in the survey area. Of these three threatened fauna species, one species is considered likely to occur and two are considered unlikely. The three species and their likelihood to occur in the survey area are discussed below.

5.1.1 Species considered likely to occur in the survey area

Malleefowl (*Leipoa ocellata)*

In the past century, the range of the Malleefowl has contracted, particularly in arid areas and at the periphery of its former range (Benshemesh 2007). In Australia, clearing for agriculture has eliminated and fragmented much of the Malleefowl habitat, resulting in localised extinctions and fragmented populations (Garnett *et al.* 2011). In WA since 1981, the range of the Malleefowl has been estimated to have contracted by between 28 and 30% (Benshemesh 2007, Parsons *et al.* 2008).

Historically, the species was originally common and widespread in semiarid zones, mainly in scrubs of mallee and other low eucalypts on sandy and lateritic soils; also, acacia scrubs on heavy red soils, especially north and east of the mulga-eucalypt line. The Malleefowl is now generally rare to uncommon and patchily distributed due to habitat loss.

Studies have shown that a wide range of food shrubs, rather than an abundance of any one species is probably important for birds during for example droughts (Harlen & Priddel 1996). This is supported by other studies showing that Malleefowl are more abundant in areas where shrubs are more diverse (Woinarski 1989). As shown in section 3.1, there was average rainfall for the twelve months before the survey and the survey area does appear to have a degree of shrub diversity.

Malleefowl have a relatively large home range that can be up to 4 km^2 in low rainfall areas (Booth 1987). Predation by the introduced fox is also thought to be limiting the abundance of Malleefowl and in many areas and may be a major cause of decline (Benshemesh 2007). No Foxes or Cats, their tracks or scats were recorded during the survey, however they are elusive and difficult to observe and there is no reason either species couldn't predate Malleefowl in the survey area.

Malleefowl prefer habitat with a dense canopy and an open ground layer in which they can construct their mounds (Benshemesh 2007). Benshemesh (1992) also found that dense canopy cover was the most important feature associated with high breeding densities at sites in Victoria. Fire history is also important with Malleefowl birds preferring old growth (i.e., long unburnt) mallee. Fire has a major influence on the structure and floristic composition of habitats that Malleefowl occupy.

Mixed Eucalyptus Woodland, Salmon Gum Woodland and Drainage Area habitats all lacked a dense canopy, making all these habitat types unsuitable for Malleefowl breeding. The Acacia Shrubland habitat contained a dense Acacia shrub canopy, however this habitat was generally on hill slopes which were too steep and rocky for Malleefowl to build mounds.

During the survey, no Malleefowl or evidence of Malleefowl (including mounds or scratching) was recorded in the survey area.

Malleefowl and mounds have been recorded during fauna surveys previously undertaken in the vicinity of the survey area (Table 1) and a total of 126 Malleefowl records were present in the DBCA threatened fauna database. These records were from a 70 km radius of the survey area, the closest being 2 km to the south of the survey area. The most recent DBCA record of the Malleefowl is from 2023, approximately 38 km to the south-east of the survey area. In addition to the DBCA database records, a potentially active mound was recorded approximately 8 km to the north of the survey area (at the Patricia Jean Pit Project).

5.1.2 Species considered unlikely to occur in the survey area

Carnaby's Black Cockatoo (*Calyptorhynchus latirostris)*

Carnaby's Black Cockatoo is endemic to south-west WA and is distributed from the Murchison River to Esperance and inland to Coorow, Kellerberrin and Lake Cronin (Cale 2003). The species was once common, but the population has declined significantly in the last half century and is now locally extinct in some areas (Johnstone & Storr 1998; Shah 2006). In the last 45 years (prior to Cale 2003) the species has suffered a 50% reduction in its abundance (Cale 2003). Since then, trend

analyses of the Great Cocky Counts 2010 – 2019 identified strong indications that the population of Carnaby's Black-Cockatoo inhabiting the Perth-Peel Coastal Plain continues to decline and despite a recent stabilisation (2016 - 2018) of the local population, the trend since 2010 shows a 35% decline of Carnaby's Black Cockatoo (BirdLife 2020).

Salmon Gum, a known breeding and roosting tree for Carnaby's Black Cockatoo, was recorded in the survey area. The survey area however, is approximately 250 km to the east of the known distribution of the species. In addition, the DBCA threatened fauna database returned just four records of Carnaby's Black Cockatoo, all of which were from 2016 - 2018, from approximately 35 km from the survey area. A lack of records and the location of the survey area being outside of the species known range, result in Carnaby's Black Cockatoo being considered unlikely to occur in the survey area.

Peregrine Falcon (*Calyptorhynchus latirostris)*

The Peregrine Falcon is an uncommon but wide-ranging bird across Australia (Barrett *et al.* 2003). It occurs mainly along rivers and ranges as well as wooded watercourses and lakes and nests primarily on cliffs, granite outcrops and quarries. The diet of the Peregrine Falcon has been well studied and primarily includes flocking species such as parrots, pigeons and on the east coast European Starlings (*Sturnus vulgaris*) (Olsen & Fuentes 2008).

There were 2 records the Peregrine Falcon in the DBCA threatened fauna database, from 2013 and 2014. Both records are almost 70 km from the survey area and are classed as 'not-defined' in their certainty. A lack of records and a lack of suitable habitat in the way of wooded watercourses and rivers results in the species being considered unlikely to occur in the survey area.

5.2 Fauna Habitat

Mixed Eucalyptus Woodland

Mixed Eucalyptus Woodland comprised 59.3 % (184 ha) of the survey area. This habitat consisted of mixed eucalypts, such as *E. graffithsii, E. torquate, E. clelandiorum* and *E. campaspe,* over scattered tall shrubs including Acacia, over mixed low shrubs such as Eremophila and Senna sandy flats and low hills.

The eucalyptus trees and mid-storey shrubs provide structure and habitat for several small birds, including the Grey Shrike-thrush, Crested Bellbird and various Honeyeater species, all of which were recorded in this habitat. In some areas, leaf-litter is present and so provides shelter required by small reptiles and mammals. In some areas, the sandy substrate provides habitat for burrowing species, particularly reptile species.

Mixed Eucalyptus Woodland is considered unsuitable for Malleefowl breeding. In general, vegetation is too sparse and lacks the vegetation structure required by the species.

Salmon Gum Woodland

Salmon Gum Woodland comprised 12.1% (37.6 ha) of the survey area. This habitat consisted of stands of remnant Salmon Gum (*E. salmonophloia*), with limited vegetation structure, on sandy/stoney flats. Much of the Salmon Gum Woodland lacked mid-story vegetation and contained limited ground cover. The large Salmon Gums provide habitat for several bird species, for example the Australian Ringneck, which breeds in hollows and some areas of leaf-litter provided habitat for small mammals and reptile species.

Salmon Gum Woodland is considered unsuitable for Malleefowl breeding. In general, vegetation is too sparse and lacks the vegetation structure required by the species. In addition, Salmon Gum Woodland was mainly on the sandy flats, which may be prone to flooding during high rainfall events.

Acacia Shrubland

Acacia Shrubland habitat comprised 9.9% (30.7 ha) of the survey area. This habitat consisted of a mix of Acacia shrubs and mixed herbs/grasses on rocky hills. While the Acacia Shrubland contains denser vegetation and structure that the woodland habitats and drainage areas, the hill slopes are considered too steep for Malleefowl to build mounds on. In addition, the substrate consists of rock so is unsuitable for mound building. A lack of leaf litter also results in a lack of material for mound building, and a lack of shelter for other fauna species, including reptiles.

Drainage Area

The Drainage Area habitat comprised 5.4% (16.8 ha) of the survey area. This habitat consisted of minor creek lines with mixed mallee eucalypts and mixed Acacia shrubs. There was no water present during the survey, however the vegetation structure provides habitat to small bird species including Robins and Honeyeaters (recorded in this habitat) and the sandy soil of the creek-bed provided some habitat for burrowing reptiles.

The presence of water in this habitat is episodic, however Malleefowl do not build mounds in areas where there would be a potential flood risk.

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Appendices

Appendix 1: Conservation Categories

Categories of Threatened Fauna Species under the EPBC Act

Conservation Code	Description
Ex	Extinct Taxa which at a particular time if, at the time, there is no reasonable doubt that the last member of the species has died.
ExW	Extinct in the Wild Taxa which is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
CE	Critically Endangered Taxa which at a particular time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
En	Endangered Taxa which is not critically endangered and it is facing a very high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
Vu	Vulnerable Taxa which is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

Source: Environment Protection and Biodiversity Conservation Act 1999.

Categories of Threatened Flora and Fauna Species under the BC Act

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

CONSERVATION CODES

For Western Australian Flora and Fauna

Threatened, Extinct and Specially Protected fauna or flora[1] are species[2] which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such.

The *Wildlife Conservation (Specially Protected Fauna) Notice 2018* and the *Wildlife Conservation (Rare Flora) Notice 2018* have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018* to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the *Biodiversity Conservation Act 2016*.

Categories of Threatened, Extinct and Specially Protected fauna and flora are:

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.

Conservation codes for Western Australian flora and fauna

Extinct species

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

EX Extinct species

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

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*.

Conservation codes for Western Australian flora and fauna

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.

1 **Priority 1: 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.

2 **Priority 2: 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.

3 **Priority 3: 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.

4 **Priority 4: 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.

[1] The definition of flora includes algae, fungi and lichens
[2]Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

Last updated 3 January 2019

Appendix 2: Fauna Database Searches

Threatened Fauna Database (DBCA)

SCI_NAME	COM_NAME	CLASS	STATUS	WA_STATUS	EPBC_STAT	DATE	SOURCE	CERTAINTY	OBS_METHOD	OBS_TYPE	SEC_SIGN	COUNT	LOCALITY	SITE	ACCURACY_	LAT	LONG	FAMILY	GENUS	SPECIES
Oxyura australis	Blue-billed Duck	BIRD	Priority	P4		16/07/2014	BIRDATA	Not Defined				0	Credo extra 7 Rowles Lagoon	Credo extra 7	100	-30.4469	120.8419	Anatidae	Oxyura	australis
Oxyura australis	Blue-billed Duck	BIRD	Priority	P4		13/04/2016	BIRDATA	Not Defined				0	Campsite	Rowles Lagoon Campsite	0	-30.4267	120.8631	Anatidae	Oxyura	australis
Oxyura australis	Blue-billed Duck	BIRD	Priority	P4		9/10/2015	BIRDATA	Not Defined				0	Rowles Lagoon	Rowles Lagoon	500	-30.4661	120.8278	Anatidae	Oxyura	australis
Oxyura australis	Blue-billed Duck	BIRD	Priority	P4		9/10/2015	BIRDATA	Not Defined				0	Credo 26	Credo 26	100	-30.4331	120.8631	Anatidae	Oxyura	australis
Oxyura australis	Blue-billed Duck	BIRD	Priority	P4		12/10/2015	BIRDATA	Not Defined				0	Credo Station	Credo Station	0	-30.4269	120.8594	Anatidae	Oxyura	australis
Oxyura australis	Blue-billed Duck	BIRD	Priority	P4		25/04/1999	BIRDATLAS2	Not Defined				0	Rowles Lagoon	Rowles Lagoon	100	-30.4242	120.8639	Anatidae	Oxyura	australis
Oxyura australis	Blue-billed Duck	BIRD	Priority	P4		30/08/1999	BIRDATLAS2	Not Defined				0	Carnage Lake	Carnage Lake	100	-30.4009	120.8737	Anatidae	Oxyura	australis
Oxyura australis	Blue-billed Duck	BIRD	Priority	P4		7/10/1999	BIRDATLAS2	Not Defined				0	Rowles Lagoon	Rowles Lagoon	500	-30.432	120.8514	Anatidae	Oxyura	australis
Zanda latirostris	Carnaby's Cockatoo	BIRD	Threatened -	EN	EN	12/11/2016	BIRDATA	Not Defined				0	367 Collins	367 Collins	200	-30.7512	121.456	Cacatuidae	Zanda	latirostris
Zanda latirostris	Carnaby's Cockatoo	BIRD	Threatened -	EN	EN	9/12/2016	BIRDATA	Not Defined				0	Cape Lilac on alley	Cape Lilac on alley	0	-30.7514	121.4561	Cacatuidae	Zanda	latirostris
Zanda latirostris	Carnaby's Cockatoo	BIRD	Threatened -	EN	EN	30/08/2017	BIRDATA	Not Defined				0	Piccadilly St West	Piccadilly St West	0	-30.7519	121.4574	Cacatuidae	Zanda	latirostris
Zanda latirostris	Carnaby's Cockatoo	BIRD	Threatened -	EN	EN	14/06/2018	TFAUNA	Very Certain	Opportunistic sighting	Day sighting	No other signs	1	Sommerville	Southern corner of Hay St and Hutton St	1000	-30.7628	121.4541	Cacatuidae	Zanda	latirostris
Nyctophilus major tor	Central Long-eared Bat	MAMMAL	Priority	P3		7/05/1981	WAM Mamm	WAM Vouchered	Collection	Specimen		1			10	-30.95	121.1667	Vespertilionic	Nyctophilus	major (tor)
Dasyurus geoffroii	Chuditch	MAMMAL	Threatened -	VU	VU	11/07/1974	TFAUNA	Certain	Opportunistic sighting	Caught or trapped	No other signs	1	Kambalda East Coolgardie Gorge	1 mile N of Kambalda East townsite, at edge of Lake Lefroy in sandy mulga country	1000	-31.182043	121.668109	Dasyuridae	Dasyurus	geoffroii
Tringa nebularia	Common Greenshank	BIRD	Specially Pro	MI	MI	1/01/2013	BIRDATA	Not Defined				0	wetland	Coolgardie Gorge wetland	0	-30.9636	121.195	Scolopacidae	Tringa	nebularia
Tringa nebularia	Common Greenshank	BIRD	Specially Pro	MI	MI	10/01/2013	BIRDATA	Not Defined				0	House Dam Credo 5	House Dam Credo 5	100	-30.4678	120.8264	Scolopacidae	Tringa	nebularia
Tringa nebularia	Common Greenshank	BIRD	Specially Pro	MI	MI	6/12/2017	BIRDATA	Not Defined				0	Rowles Lagoon	Rowles Lagoon	0	-30.4335	120.8596	Scolopacidae	Tringa	nebularia
Tringa nebularia	Common Greenshank	BIRD	Specially Pro	MI	MI	25/11/1980	BIRDATLAS1	Not Defined				0	KANOWNA	KANOWNA	18000	-30.582	121.4181	Scolopacidae	Tringa	nebularia
Tringa nebularia	Common Greenshank	BIRD	Specially Pro	MI	MI	7/10/1980	BIRDATLAS1	Not Defined				0	KANOWNA	KANOWNA	18000	-30.582	121.5848	Scolopacidae	Tringa	nebularia
Tringa nebularia	Common Greenshank	BIRD	Specially Pro	MI	MI	31/01/2001	BIRDATLAS2	Not Defined				0	Kopai Lake Young River Station	Kopai Lake	100	-30.7478	121.2672	Scolopacidae	Tringa	nebularia
Tringa nebularia	Common Greenshank	BIRD	Specially Pro	MI	MI	26/02/2006	BIRDATLAS2	Not Defined				0	Lake	Young River Station Lake	100	-30.7725	121.0447	Scolopacidae	Tringa	nebularia
Tringa nebularia	Common Greenshank	BIRD	Specially Pro	MI	MI	21/10/1999	BIRDATLAS2	Not Defined				0	Kurnalpi Road	Kurnalpi Road	100	-30.5801	121.6356	Scolopacidae	Tringa	nebularia
Actitis hypoleucos	Common Sandpiper	BIRD	Specially Pro	MI	MI	3/10/2014	BIRDATA	Not Defined				0	coolgardie gorge The Gorge	coolgardie gorge	0	-30.9639	121.1922	Scolopacidae	Actitis	hypoleucos
Actitis hypoleucos	Common Sandpiper	BIRD	Specially Pro	MI	MI	24/12/2011	BIRDATA	Not Defined				0	(Coolgardie0	The Gorge (Coolgardie0	0	-30.9631	121.1922	Scolopacidae	Actitis	hypoleucos
Actitis hypoleucos	Common Sandpiper	BIRD	Specially Pro	MI	MI	9/10/2012	BIRDATA	Not Defined				0	C2, Credo Station	C2, Credo Station	0	-30.4678	120.8264	Scolopacidae	Actitis	hypoleucos
Actitis hypoleucos	Common Sandpiper	BIRD	Specially Pro	MI	MI	10/10/2012	BIRDATA	Not Defined				0	Credo C2 Coolgardie Gorge	Credo C2	0	-30.4678	120.8264	Scolopacidae	Actitis	hypoleucos
Actitis hypoleucos	Common Sandpiper	BIRD	Specially Pro	MI	MI	1/01/2013	BIRDATA	Not Defined				0	wetland Credo GWW	Coolgardie Gorge wetland	0	-30.9636	121.195	Scolopacidae	Actitis	hypoleucos
Actitis hypoleucos	Common Sandpiper	BIRD	Specially Pro	MI	MI	5/10/2013	BIRDATA	Not Defined				0	homestad	Credo GWW homestad	0	-30.4811	120.8283	Scolopacidae	Actitis	hypoleucos
Actitis hypoleucos	Common Sandpiper	BIRD	Specially Pro	MI	MI	5/10/2002	BIRDATLAS2	Not Defined				0	Rowles Lagoon	Rowles Lagoon	100	-30.4268	120.8648	Scolopacidae	Actitis	hypoleucos
Actitis hypoleucos	Common Sandpiper	BIRD	Specially Pro	MI	MI	17/09/2003	BIRDATLAS2	Not Defined				0	Rowles Lagoon Young River Station	Rowles Lagoon	100	-30.4265	120.8637	Scolopacidae	Actitis	hypoleucos
Calidris ferruginea	Curlew Sandpiper	BIRD	Threatened -	CR	CR & MI	26/02/2006	BIRDATLAS2	Not Defined				0	Lake	Young River Station Lake	100	-30.7725	121.0447	Scolopacidae	Calidris	ferruginea
Calidris ferruginea	Curlew Sandpiper	BIRD	Threatened -	CR	CR & MI	21/10/1999	BIRDATLAS2	Not Defined				0	Kurnalpi Road	Kurnalpi Road	100	-30.5801	121.6356	Scolopacidae	Calidris	ferruginea
Plegadis falcinellus	Glossy Ibis	BIRD	Specially Pro	MI	MI	5/12/1981	BIRDATLAS1	Not Defined				0	ORA BANDA	ORA BANDA	18000	-30.4154	120.9181	Threskiornith	Plegadis	falcinellus
Plegadis falcinellus	Glossy Ibis	BIRD	Specially Pro	MI	MI	31/12/1981	BIRDATLAS1	Not Defined				0	KARLKURLA	KARLKURLA	18000	-30.7487	121.4181	Threskiornith	Plegadis	falcinellus
Tringa brevipes	Grey-tailed Tattler	BIRD	Specially Pro	MI & P4	MI	29/09/2017	BIRDATA	Not Defined				0	Lake Douglas	Lake Douglas	0	-30.8529	121.4054	Scolopacidae	Tringa	brevipes
Thinornis cucullatus	Hooded Plover	BIRD	Priority	P4		7/10/1980	BIRDATLAS1	Not Defined				0			18000	-30.582	121.5848	Charadriidae	Thinornis	cucullatus
Thinornis cucullatus	Hooded Plover	BIRD	Priority	P4		1/01/1992	TFAUNA	Certain	Survey	Sighting		0	Arrow Lake	Arrow Lake	50000	-30.533332	121.399997	Charadriidae	Thinornis	cucullatus
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	22/11/2009	FAUNASURV	Certain	Survey	Unknown		1	WIDGIEMOOLTHA	GoldfieldsLakeLefroy, LakeLefroy	100	-31.332	121.7329	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	3/02/2012	FAUNASURV	Certain	Survey	Unknown		1	FEYSVILLE	Kalgoorlie, Goldfields, Mt Martin	100	-31.0169	121.7006	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	2/06/2012	FAUNASURV	Certain	Survey	Unknown		1	FEYSVILLE	Kalgoorlie Region, Goldfields, Jubilee mine	100	-31.1145	121.618	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	2/06/2012	FAUNASURV	Certain	Survey	Unknown		1	FEYSVILLE	Kalgoorlie Region, Goldfields, Jubilee mine	100	-31.0679	121.6032	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	2/06/2012	FAUNASURV	Certain	Survey	Unknown		1	FEYSVILLE	Kalgoorlie Region, Goldfields, Jubilee mine	100	-30.9834	121.5923	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	2/06/2012	FAUNASURV	Certain	Survey	Unknown		1	FEYSVILLE	Kalgoorlie Region, Goldfields, Jubilee mine	100	-31.0894	121.6413	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	2/06/2012	FAUNASURV	Certain	Survey	Unknown		1	FEYSVILLE	Kalgoorlie Region, Goldfields, Jubilee mine	10000	-31.0423	121.6089	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	20/04/2012	FAUNASURV	Certain	Survey	Unknown		1	BULONG	Hampton Hill, Bulong Mining Lease M25/333	3000	-30.8245	121.7624	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	29/07/1994	TFAUNA	Certain	Opportunistic sighting	Secondary sign		0	Bullabulling	one active nest at Bullabulling No. 8 Pumping station.	10000	-30.9758	120.900004	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	8/02/1995	TFAUNA	Moderately Certain	Opportunistic sighting	Day sighting		1	Londonderry	Yerilla Sandalwood Reserve	1000	-31.048711	121.326725	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	15/11/2000	TFAUNA	Certain	Opportunistic sighting	Day sighting		1	Mount Burges	access road to Kundana Mining Lease - "30km NW (10km W & 22km N) of Kalgoorlie"	300	-30.709036	121.223782	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	1/05/1985	TFAUNA	Certain	Opportunistic sighting	Sighting		2	Jaurdie Hills	Jaurdie Hills	10000	-30.702998	120.897002	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	13/12/2006	TFAUNA	Certain	Opportunistic sighting	Day sighting		1	Bullabulling	Bullabulling	1000	-31.05184	120.948071	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	18/01/2007	TFAUNA	Certain	Opportunistic sighting	Day sighting		2	Bullabulling	Bullabulling	1000	-31.018815	120.951963	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	25/06/2008	TFAUNA	Certain	Opportunistic sighting	Day sighting	No other signs	2	Bullabulling	Bullabulling pastoral lease, 10km west of the Bullabulling Pub and 2 kms south of the highway	1000	-31.074302	120.819611	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	10/11/2009	TFAUNA	Certain	Opportunistic sighting	Day sighting	Mound	1	Mount Burges	North of Mount Burges	300	-30.811303	121.068105	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	14/10/2009	TFAUNA	Certain	Opportunistic sighting	Day sighting		1	Bullabulling Goldfields Woodlands National	Bullabulling, road from Bullabulling to Stewart Goldfields Woodlands NP, along track to Wallaroo Rocks CP, 6km N of Great Eastern	1000	-30.988275	120.863671	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	18/01/2010	TFAUNA	Certain	Opportunistic sighting	Day sighting		2	Park	HWY.	1000	-31.130003	120.533331	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	22/10/2010	TFAUNA	Certain	Opportunistic sighting	Sighting		1		Vic Rock Road	1000	-31.333277	120.914328	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU		TFAUNA	Certain	Historical (written)	Sighting		1		South of Wallaroo Rock	1000	-30.829531	120.50629	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	4/08/2011	TFAUNA	Certain	Opportunistic sighting	Day sighting		1		Yallari Timber Reserve	1000	-31.139856	121.365579	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened -	VU	VU	4/08/2011	TFAUNA	Certain	Opportunistic sighting	Secondary sign	Mound	0		Yallari Timber Reserve	1000	-31.121959	121.39076	Megapodiidae	Leipoa	ocellata

Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	27/09/2011	TFAUNA	Certain	Opportunistic sighting	Day sighting		1			1000	-31.037887	121.086078	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	8/11/2011	TFAUNA	Certain	Opportunistic sighting	Day sighting		1	Victoria Rock Nature Reserve	UCL between Holland track and Victoria Rock Nature Reserve on the Victoria Rock Road on road from Bullabulling to Stuart sighting,	1000	-31.497219	120.820557	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	14/10/2009	TFAUNA	Certain	Opportunistic sighting	Day sighting		1		off Great Eastern Highway	1000	-30.988275	120.863671	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	10/11/2009	TFAUNA	Certain	Opportunistic sighting	Day sighting		1		north of Mt Burgess	1000	-30.686002	121.060324	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	10/11/2011	TFAUNA	Certain	Survey	Caught or trapped		1		gravel area just of side of the raod at Yarri and Bariick Kanowna Belle access road intersection.	1000	-30.61833	121.596107	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	9/07/2012	TFAUNA	Certain	Opportunistic sighting	Day sighting		2	Coolgardie	Just off cave hill road in Widgiemooltha close to one of Focus Minerals small operations.	1000	-31.326949	121.257498	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	15/04/2013	TFAUNA	Certain	Opportunistic sighting	Dead		1	Bullabulling	48km West of Coolgardie, No 8 pump Denardi Station, Great Eastern Highway	1000	-31.119447	120.720079	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	23/04/2013	TFAUNA	Moderately Certain	Opportunistic sighting	Day sighting		1	Bullabulling	~10km east if Bullabulling (40km east of Coolgardie) on Great Eastern Highway	1000	-30.978604	120.962381	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	16/05/2013	TFAUNA	Moderately Certain	Opportunistic sighting	Night sighting		1	Feysville	Out the front of Pevnatty Crib room on active haul road. A higly disturbed area.	1000	-31.005149	121.594774	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	1/05/2012	TFAUNA	Certain	Targeted survey	Day sighting		1	Orabanda	Ora Banda area.	1000	-30.363508	121.09041	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	15/10/2012	TFAUNA	Certain	Targeted survey	Day sighting		1	Orabanda	Ora Banda area.	1000	-30.366673	121.08471	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	15/10/2012	TFAUNA	Certain	Targeted survey	Day sighting		1	Orabanda	Ora Banda area.	1000	-30.355546	121.086955	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	15/10/2012	TFAUNA	Certain	Targeted survey	Day sighting		1	Orabanda	Ora Banda area.	1000	-30.363343	121.092088	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	15/10/2012	TFAUNA	Certain	Targeted survey	Day sighting		1	Orabanda	Ora Banda area.	1000	-30.369426	121.07626	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	15/10/2012	TFAUNA	Certain	Targeted survey	Day sighting		1	Orabanda	Ora Banda area.	1000	-30.370083	121.074291	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	15/10/2012	TFAUNA	Certain	Targeted survey	Day sighting		1	Orabanda	Ora Banda area.	1000	-30.36947	121.080473	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	17/05/2013	TFAUNA	Certain	Opportunistic sighting	Secondary sign	Mound	0	reserve	Scahil Timber reserve	1000	-31.186666	121.279727	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	19/08/2013	TFAUNA	Certain	Opportunistic sighting	Day sighting	Mound	1	Burra Rock Conservation Reserve	Carpark at Burra Rock. Mound found within adjacent bush habitat.	1000	-31.395489	121.197521	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	12/09/2013	TFAUNA	Certain	Opportunistic sighting	Day sighting		1	Ora Banda	500m before Cawse Nickel turn off on Broad Arrow-Ora Banda road, heading towards Ora Banda	1000	-30.413262	121.178106	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	17/09/2013	TFAUNA	Certain	Opportunistic sighting	Day sighting		1	Kanowna	~5km before the Mt Pleasant Office turn off on Mt Pleasant Rd, off Menzies Highway	1000	-30.52332	121.311528	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	16/10/2013	TFAUNA	Certain	Opportunistic sighting	Dead		1	Kanowna	3.1km north of Paddington Mill (35km north of Kalgoorlie) on Menzies Highway	1000	-30.446704	121.3325	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	16/10/2013	TFAUNA	Certain	Opportunistic sighting	Day sighting		1		3.2km east of cawse nickel turn off on the Ora Banda - Broad Arrow Rd	1000	-30.412503	121.180649	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	21/10/2013	TFAUNA	Moderately Certain	Opportunistic sighting	Day sighting		1	Feysville	Woolibar Station, just south of where Woolibar creek crosses the Goldfields Highway.	1000	-30.943873	121.559602	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	12/11/2013	TFAUNA	Certain	Opportunistic sighting	Dead		1	Kanowna	~4.45km east of Cawse Nickel turn off on the Broad Arrow- Ora Banda Rd	1000	-30.418273	121.225595	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	19/12/2013	TFAUNA	Certain	Opportunistic sighting	Dead		1	Kanowna	~100-200m W of drilling track access road, on the Braod Arrow to Ora Banda road, Near Cawse Nickel turn off.	1000	-30.417269	121.215433	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	15/12/2013	TFAUNA	Certain	Opportunistic sighting	Day sighting		1	Kanowna	~10km W of Menzies Hwy on Ora Banda - Broad Arrow road	1000	-30.413406	121.188512	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	5/12/2013	TFAUNA	Certain	Opportunistic sighting	Day sighting		1		3.26km E of Cawse Nickel turn off on Broad Arrow - Ora banda Rd	1000	-30.416986	121.213262	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	29/01/2014	TFAUNA	Certain	Opportunistic sighting	Day sighting		2	Burra Rock	Burra Rock, Directly west of campsite, south of old east-west track	1000	-31.394914	121.198993	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	27/04/2015	TFAUNA	Certain	Opportunistic sighting	Day sighting	nest	1	Parkeston	100m along a small track - off a major dirt road; approximately 9km NE of Kalgoorlie	1000	-30.689333	121.563719	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	6/03/2015	TFAUNA	Certain	Opportunistic sighting	Day sighting		2	Bulong	10.6km SSE of Hampton Hill Station homestead	1000	-30.841365	121.727546	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	1/04/2015	TFAUNA	Certain	Opportunistic sighting	Day sighting		2	Feysville	Brown Hil on Woolubar Station. Kambolda Rd, Boulder WA	1000	-30.976333	121.510195	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	1/03/2016	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	No other signs	1	Coolgardie	Coolgardie North Rd, approx. 5km N of Coolgardie	1000	-30.907599	121.180503	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	2/02/2016	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	No other signs	1	Coolgardie	Coolgardie North Rd, approx. 7km N of Coolgardie, near Bonnievale	1000	-30.8813	121.173899	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	30/12/2015	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	No other signs	1	Coolgardie	Between Burra Rocks Rd and Coolgardie-Esperance Rd, approx. 5km S of Coolgardie	1000	-31.013937	121.200889	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	21/01/2016	TFAUNA	Certain	Opportunistic sighting	Dusk sighting	No other signs	1	Yallari Timber Reserve	Yallari Timber Reserve, central N-S track	1000	-31.1284	121.3396	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	4/10/2016	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	No other signs	1	Mount Burges	Traveling route back from Lake Carnage (Coolgardie Nth Rd??), 10km S of Ora Banda	1000	-30.500398	120.937504	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	1/06/1996	TFAUNA	Moderately Certain	Opportunistic sighting	Secondary sign	Mound	0	Coolgardie	4WD Holland Track, 200km NE of Mt Holland (cannot find Holland Track)	10000	-31.0052	121.3053	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	2/11/1990	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	No other signs	1	WALLAROO	1 km east of Wallaroo Rock	0	-30.808333	120.5	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	28/01/1965	TFAUNA	Moderately Certain	Historical (written)	Secondary sign	Mound	0	MOUNT BURGES	12 miles North of Coolgardie	1000	-30.7833	121.1167	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	1/09/1994	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	No other signs	2	BULLABULLING	22 kms west of Coolgardie	1000	-30.984965	120.939215	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	5/02/2004	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	No other signs	1	KANOWNA	50 km nth of kalgoorlie on main hwy nth of Mt Vetters homestead	0	-30.566667	121.2	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	1/01/1902	TFAUNA	Moderately Certain	Opportunistic sighting	Secondary sign	Mound	0	BOORARA	Boorara	10000	-30.8	121.6333	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	29/07/1994	TFAUNA	Moderately Certain	Opportunistic sighting	Secondary sign	Mound	0	WALLAROO	Bullabulling No. 8 Pumping station.	0	-31.065391	120.534792	Megapodiidae	Leipoa	ocellata

Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	2/07/2001	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	No other signs	1	BULONG	Corsair Mine 10km E of Kalgoorlie; 1km S of Bulong Rd on graded track heading E	0	-30.75	121.683333	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	1/01/1988	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	No other signs	1	MOUNT BURGES	Eight Mile Rock dam	0	-30.8	121	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	20/09/2002	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	No other signs	2	KARRAMINDIE	grt eastern hway 1 km kal side of mungarrie industrial area	1000	-30.866667	121.316667	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	2/04/2002	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	No other signs	2	BULONG	Hampton Hill Station, 16km ESE of Boulder b/w Boorara Mine Site & Golden Ridge	0	-30.766667	121.65	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	17/04/2003	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	Mound	1	KURNALPI	intersection of Yarrie and Carmelia rds, sth of Carmelia rd 500 m east side of nth side ridge	300	-30.55	121.696333	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	1/01/1910	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	No other signs	1	LAMINGTON	Kalgoorlie	50000	-30.7333	121.4667	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	1/01/1991	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	No other signs	1	BULLABULLING	Kangaroo Hills Timber Reserve	0	-31.023611	121.042222	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	29/07/1994	TFAUNA	Moderately Certain	Opportunistic sighting	Secondary sign	Mound	0	WALLAROO	No 8 Pumping Station	0	-31.066667	120.533333	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	1/01/2016	TFAUNA	Moderately Certain	Opportunistic sighting	Dead	Feathers	1	ORA BANDA	Ora Banda	10000	-30.3666	121.0667	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	4/11/1947	TFAUNA	Moderately Certain	Opportunistic sighting	Secondary sign	Mound	0	LAMINGTON	PO Kalgoorlie	50000	-30.7333	121.4667	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	1/01/1988	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	No other signs	1	MOUNT BURGES	WMC sand pit Jaurdi Hills Rd	0	-30.816667	121.066667	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	8/02/1995	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	No other signs	1	LONDONDERRY	Yallari Timber Reserve	0	-31.0665	121.321833	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	8/02/1995	TFAUNA	Moderately Certain	Opportunistic sighting	Day sighting	No other signs	1	LONDONDERRY	Yerilla Sandalwood Reserve	0	-31.065278	121.326111	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	25/05/2017	TFAUNA	Very Certain	Opportunistic sighting	Day sighting	No other signs	1	Goldfields Woodlands Conservation P	5km N of Victoria Rock, on Coolgardie Vic Rock Rd, in Goldfields Woodlands CP	1000	-31.240835	120.938053	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	24/10/2017	TFAUNA	Very Certain	Monitoring	Remote camera	No other signs	1	Londonderry	Scahill Rimber Reserve, on track south of reserve	30	-31.20692	121.21599	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	3/11/2017	TFAUNA	Very Certain	Monitoring	Remote camera	No other signs	1	Londonderry	Scahill Rimber Reserve, on track south of reserve	1000	-31.2238	121.2349	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	20/02/2018	TFAUNA	Very Certain	Opportunistic sighting	Dawn sighting	No other signs	2	Kanowna	Borad Arrow-Ora Banda Rd, 3km E of Cawse Nickel turnoff	1000	-30.4169	121.2105	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	19/02/2018	TFAUNA	Not Sure	Opportunistic sighting	Sighting	No other signs	1	Ora Banda	Norton Gold field mining lease road	1000	-30.3984	121.1507	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	9/09/2017	TFAUNA	Moderately Certain	Opportunistic sighting	Day sighting	Heard/Call	1	Karramindie	Karramindie State Forest No. 8	1000	-31.004197	121.398355	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	17/07/2017	TFAUNA	Very Certain	Opportunistic sighting	Dusk sighting	No other signs	1	Karramindie	50m E of the S/W corner gate of Karramindie State Forest, where the gully crosses the track	1000	-31.017337	121.385681	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	21/03/2018	TFAUNA	Very Certain	Opportunistic sighting	Secondary sign	Mound	0	Karramindie	1.7km S of Karramindie State Forest on Hampton Location 53	10000	-30.968	121.398	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	17/04/2018	TFAUNA	Certain	Opportunistic sighting	Day sighting	No other signs	1	Londonberry	Old woodline track running SW away from Scahill Timber Reserve	300	-31.1891	121.2054	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	19/04/2018	TFAUNA	Very Certain	Monitoring	Remote camera	No other signs	2	Londonderry	3.5km S of Scahill Timber Reserve, Londonderry	30	-31.222298	121.233105	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	3/05/2018	TFAUNA	Certain	Opportunistic sighting	Day sighting	No other signs	1	Kanowna	Golden cities Mine Site haul road, Kanowna	1000	-30.433113	121.378012	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	7/12/2005	TFAUNA	Moderately Certain	Opportunistic sighting	Sighting	No other signs	1	WIDGIEMOOLTHA	400 m on the W bound track from the Mt Edward's Trig Station E71	1000	-31.473	121.539	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	3/07/2018	TFAUNA	Very Certain	Opportunistic sighting	Day sighting	Mound	0	Kalgoorlie	West north-west of Kalgoorlie about 20km	1000	-30.5262	121.2903	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	27/09/2018	TFAUNA	Certain	Opportunistic sighting	Day sighting	No other signs	2	Golden Cities	Goldfields mining tenure	1000	-30.408495	121.166922	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	22/08/2007	TFAUNA	Certain	Opportunistic sighting		No other signs	1	Coolgardie	Victoria Rock Rd, about 15km south of Coolgardie	1000	-31.0848	121.0151	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	2/07/2007	TFAUNA	Certain	Opportunistic sighting			1	Kalgoorlie	Broad Arrow-Ora Banda Rd, few km east of Cawse Mine turnoff	10000	-30.4164	121.205403	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	29/05/2007	TFAUNA	Certain	Opportunistic sighting			1	Coolgardie	Burra Rock Road, 11.2km north of DEC Burra Rock Reserve boundary sign	1000	-31.28	121.0904	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	18/07/2012	TFAUNA	Certain	Opportunistic sighting			4	Coolgardie	Borefields on Focus owned mine lease, near bore 8	1000	-30.811108	121.177904	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	1/11/2008	TFAUNA	Certain	Opportunistic sighting			1	Kambalda		1000	-31.235422	121.496055	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	1/01/2006	TFAUNA	Certain	Opportunistic sighting			1	Coolgardie	23.2km south of T intersection of Coolgardie Norseman Rd	1000	-31.077927	121.356567	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	19/02/2008	TFAUNA	Certain	Opportunistic sighting			1	Woolgangie	6km S of Great Eastern Hwy, between Woolgangie and number 8 pump station, approx. 50km west of Coolgardie	1000	-31.2465	120.5415	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	16/01/2008	TFAUNA	Certain	Opportunistic sighting	Dusk sighting		1	Coolgardie	Great Eastern Hwy, 40.5km west of Coolgardie	1000	-31.090556	120.759167	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	14/07/2009	TFAUNA	Certain	Opportunistic sighting			2	Coolgardie	Juardi Hills Rd, 100m north of crest	1000	-30.805193	121.013601	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	5/03/2009	TFAUNA	Certain	Opportunistic sighting			1	Londonerry	about 3km south of Burra Rock Reserve along Burra Rock Road	1000	-31.3593	121.1719	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	10/01/2009	TFAUNA	Certain	Opportunistic sighting	Day sighting	Mound	1	Ora Banda	Approx. 6km north of Credo Homestead, 80km north of Coolgardie	1000	-30.463303	120.743566	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	25/11/2010	TFAUNA	Certain	Opportunistic sighting			1	Londonberry	Burra Rock Nature Reserve, next to camping area	1000	-31.3934	121.1997	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	23/10/2010	TFAUNA	Certain	Opportunistic sighting			1	Wallaroo	On entrance track to Wallaroo Rock	1000	-30.829531	120.50629	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	8/10/2010	TFAUNA	Certain	Opportunistic sighting			1	Kambalda	5km along pipeline access road off Cave Rocks mine haul rd	1000	-31.225	121.513889	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	24/05/2010	TFAUNA	Certain	Opportunistic sighting	Dead		1	Kambalda	9km N of Kambalda T intersection along Goldfields Hwy	10000	-31.124797	121.622399	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	13/09/2010	TFAUNA	Certain	Opportunistic sighting			1	Bullabulling	Great Eastern Hwy, 130km E of Southern Cross, near unnamed gravel road	10000	-31.088999	120.760896	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	11/02/2011	TFAUNA	Certain	Opportunistic sighting			1	Ora Banda	Broad Arrow-Ora Banda Rd, approx. 5.5km from Norilsk Nickel access road toward east	1000	-30.412	121.1784	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	10/02/2011	TFAUNA	Certain	Opportunistic sighting			2	Londonderry	Burra Rock camping ground	1000	-31.3981	121.1806	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	18/09/2011	TFAUNA	Certain	Survey		Tracks	0	Ora Banda		1000	-30.484301	121.012756	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	18/09/2011	TFAUNA	Certain	Survey		Tracks	0	Ora Banda		1000	-30.485307	121.007777	Megapodiidae	Leipoa	ocellata

Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	28/09/2013	TFAUNA	Certain	Opportunistic sighting	Sighting		1	Coolgardie	7km south of Coolgardie on the Victoria Rock Road	1000	-30.99719	121.121131	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU		TFAUNA	Certain	Opportunistic sighting	Secondary sign	Tracks	0	Burra Rock Conservation Reserve		1000	-31.3968	121.186	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	22/12/2012	TFAUNA	Certain	Opportunistic sighting	Sighting		1	Kalgoorlie	Goldfield HWY	1000	-31.0769	121.617	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	28/06/2013	TFAUNA	Certain	Opportunistic sighting	Secondary sign	Mound	0	Ora Banda	In the bush approx 9km West	1000	-30.3755	120.966	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	17/05/2013	TFAUNA	Certain	Opportunistic sighting	Sighting		1	Ora Banda	Between Broad Arrow and Ora Banda	1000	-30.4162	121.2041	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	31/05/2013	TFAUNA	Certain	Opportunistic sighting	Sighting		1	Goldfields-Kalgoorlie/Coolgardie	Great Eastern Highway	1000	-30.9067	121.2113	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	20/03/2019	TFAUNA	Certain	Opportunistic sighting	Dusk sighting		1	Arrow Lake		10000	-30.532484	121.49693	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	31/10/2019	TFAUNA	Certain	Opportunistic sighting	Sighting		1	Mungari	Mungari turnoff from Great Eastern HWY heading South	30	-30.872284	121.30051	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	27/09/2020	TFAUNA	Very Certain	Opportunistic sighting	Day sighting		1	East side of Coolgardie north	East side of Coolgardie north Road	0	-30.47098	121.26113	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	6/04/2023	TFAUNA	Moderately Certain	Opportunistic sighting	Day sighting	Heard/Call	2	Coolgardie	North Coolgardie rd	10000	-30.948	121.152	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	31/05/2022	TFAUNA	Very Certain	Opportunistic sighting	Secondary sign	Nest	1	Scahill timber reserve	Scahill timber reserve	30	-31.1905	121.2385	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	13/01/2023	TFAUNA	Certain	Opportunistic sighting	Secondary sign	Mound	0			0	-31.1731	121.5456	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	27/09/2020	TFAUNA	Moderately Certain	Opportunistic sighting	Day sighting		1	Coolgardie	Coolgardie North rd	10000	-30.488825	120.88198	Megapodiidae	Leipoa	ocellata
Leipoa ocellata	Malleefowl	BIRD	Threatened - VU	VU	15/05/2020	TFAUNA	Very Certain	Opportunistic sighting	Day sighting		1	Federal Mine haul road	Federal Mine haul road	1000	-30.418288	121.389115	Megapodiidae	Leipoa	ocellata
Charadrius veredus	Oriental Plover	BIRD	Specially Pro MI	MI	10/10/2012	BIRDATA	Not Defined				0	C2, Credo Station	C2, Credo Station	0	-30.4678	120.8264	Charadriidae	Charadrius	veredus
Charadrius veredus	Oriental Plover	BIRD	Specially Pro MI	MI	12/10/2012	BIRDATA	Not Defined				0	Credo C2	Credo C2	0	-30.4678	120.8264	Charadriidae	Charadrius	veredus
Charadrius veredus	Oriental Plover	BIRD	Specially Pro MI	MI	5/10/2013	BIRDATA	Not Defined				0	Credo GWW homestad	Credo GWW homestad	0	-30.4811	120.8283	Charadriidae	Charadrius	veredus
Charadrius veredus	Oriental Plover	BIRD	Specially Pro MI	MI	10/01/2013	BIRDATA	Not Defined				0	Credo Airstrip	Credo Airstrip	100	-30.4683	120.8131	Charadriidae	Charadrius	veredus
Falco peregrinus	Peregrine Falcon	BIRD	Specially Pro OS		17/04/2014	BIRDATA	Not Defined				0	Credo Station - campsite - house	Credo Station - campsite - house	100	-30.4658	120.8283	Falconidae	Falco	peregrinus
Falco peregrinus	Peregrine Falcon	BIRD	Specially Pro OS		10/01/2013	BIRDATA	Not Defined				0	House Dam Credo 5	House Dam Credo 5	100	-30.4678	120.8264	Falconidae	Falco	peregrinus
Calidris ruficollis	Red-necked Stint	BIRD	Specially Pro MI	MI	25/04/2001	BIRDATLAS2	Not Defined				0	Salt Lake	Salt Lake	100	-30.5614	121.6686	Scolopacidae	Calidris	ruficollis
Calidris ruficollis	Red-necked Stint	BIRD	Specially Pro MI	MI	26/02/2006	BIRDATLAS2	Not Defined				0	Young River Station Lake	Young River Station Lake	100	-30.7725	121.0447	Scolopacidae	Calidris	ruficollis
Arenaria interpres	Ruddy Turnstone	BIRD	Specially Pro MI	MI	2/11/2016	BIRDATA	Not Defined				0	Rowles Lagoon Nature Reserve	Rowles Lagoon Nature Reserve	0	-30.4363	120.8585	Scolopacidae	Arenaria	interpres
Arenaria interpres	Ruddy Turnstone	BIRD	Specially Pro MI	MI	2/11/2016	BIRDATA	Not Defined				0	Rowles Lagoon Nature Reserve	Rowles Lagoon Nature Reserve	0	-30.4363	120.8585	Scolopacidae	Arenaria	interpres
Calidris alba	Sanderling	BIRD	Specially Pro MI	MI	13/10/2016	BIRDATA	Not Defined				0	Hannan Lake	Hannan Lake	0	-30.8176	121.5476	Scolopacidae	Calidris	alba
Calidris acuminata	Sharp-tailed Sandpiper	BIRD	Specially Pro MI	MI	13/10/2012	BIRDATA	Not Defined				0	Silver Lake	Silver Lake	0	-31.2139	121.6281	Scolopacidae	Calidris	acuminata
Calidris acuminata	Sharp-tailed Sandpiper	BIRD	Specially Pro MI	MI	30/11/1980	BIRDATLAS1	Not Defined				0	KARLKURLA	KARLKURLA	18000	-30.7487	121.4181	Scolopacidae	Calidris	acuminata
Calidris acuminata	Sharp-tailed Sandpiper	BIRD	Specially Pro MI	MI	19/11/1980	BIRDATLAS1	Not Defined				0	FEYSVILLE	FEYSVILLE	18000	-30.9154	121.5848	Scolopacidae	Calidris	acuminata
Calidris acuminata	Sharp-tailed Sandpiper	BIRD	Specially Pro MI	MI	31/12/1981	BIRDATLAS1	Not Defined				0	KARLKURLA	KARLKURLA	18000	-30.7487	121.4181	Scolopacidae	Calidris	acuminata
Calidris acuminata	Sharp-tailed Sandpiper	BIRD	Specially Pro MI	MI	29/08/1981	BIRDATLAS1	Not Defined				0	KANOWNA	KANOWNA	18000	-30.582	121.4181	Scolopacidae	Calidris	acuminata
Calidris acuminata	Sharp-tailed Sandpiper	BIRD	Specially Pro MI	MI	31/01/2001	BIRDATLAS2	Not Defined				0	Kopai Lake	Kopai Lake	100	-30.7478	121.2672	Scolopacidae	Calidris	acuminata
Calidris acuminata	Sharp-tailed Sandpiper	BIRD	Specially Pro MI	MI	31/01/2001	BIRDATLAS2	Not Defined				0	Kopai Lake	Kopai Lake	100	-30.7478	121.2672	Scolopacidae	Calidris	acuminata
Calidris acuminata	Sharp-tailed Sandpiper	BIRD	Specially Pro MI	MI	26/02/2006	BIRDATLAS2	Not Defined				0	Young River Station Lake	Young River Station Lake	100	-30.7725	121.0447	Scolopacidae	Calidris	acuminata
Calidris acuminata	Sharp-tailed Sandpiper	BIRD	Specially Pro MI	MI	21/10/1999	BIRDATLAS2	Not Defined				0	Kurnalpi Road	Kurnalpi Road	100	-30.5801	121.6356	Scolopacidae	Calidris	acuminata
Tringa glareola	Wood sandpiper	BIRD	Specially Pro MI	MI	13/09/2017	BIRDATA	Not Defined				0	OB39	OB39	0	-30.4367	120.8561	Scolopacidae	Tringa	glareola
Tringa glareola	Wood sandpiper	BIRD	Specially Pro MI	MI	12/09/2017	BIRDATA	Not Defined				0	OB34A	OB34A	0	-30.4343	120.8594	Scolopacidae	Tringa	glareola
Tringa glareola	Wood sandpiper	BIRD	Specially Pro MI	MI	15/09/2017	BIRDATA	Not Defined				0	OB95	OB95	0	-30.4335	120.8596	Scolopacidae	Tringa	glareola
Tringa glareola	Wood sandpiper	BIRD	Specially Pro MI	MI	6/12/2017	BIRDATA	Not Defined				0	Muddy Lake	Muddy Lake	0	-30.4269	120.8314	Scolopacidae	Tringa	glareola
Tringa glareola	Wood sandpiper	BIRD	Specially Pro MI	MI	30/11/1980	BIRDATLAS1	Not Defined				0	KARLKURLA	KARLKURLA	18000	-30.7487	121.4181	Scolopacidae	Tringa	glareola
Tringa glareola	Wood sandpiper	BIRD	Specially Pro MI	MI	3/11/2005	BIRDATLAS2	Not Defined				0	Kalgoorlie Sewerage overflow ponds	Kalgoorlie Sewerage overflow ponds	100	-30.8023	121.4967	Scolopacidae	Tringa	glareola
Tringa glareola	Wood sandpiper	BIRD	Specially Pro MI	MI	3/11/2005	BIRDATLAS2	Not Defined				0	Kalgoorlie Sewerage outlet	Kalgoorlie Sewerage outlet	100	-30.8095	121.4978	Scolopacidae	Tringa	glareola

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 16-Sep-2024

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	12
Listed Migratory Species:	7

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	80
Commonwealth Heritage Places:	None
Listed Marine Species:	11
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	12
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	6
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places			[Resource Information]
Name	State	Legal Status	Buffer Status
Historic			
Goldfields Water Supply Scheme, Western Australia	WA	Listed place	In feature area

Listed Threatened Species			[Resource Information]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.			
Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Aphelocephala leucopsis			
Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Falco hypoleucos			
Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Leipoa ocellata			
Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pezoporus occidentalis			
Night Parrot [59350]	Endangered	Species or species habitat may occur within area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
INSECT			
Ogyris subterrestris petrina Arid Bronze Azure [77743]	Critically Endangered	Species or species habitat may occur within area	In feature area
MAMMAL			
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area	In feature area
PLANT			
Gastrolobium graniticum Granite Poison [14872]	Endangered	Species or species habitat known to occur within area	In buffer area only
Ricinocarpos brevis [82879]	Endangered	Species or species habitat may occur within area	In buffer area only
Thelymitra stellata Star Sun-orchid [7060]	Endangered	Species or species habitat may occur within area	In buffer area only

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - AIRTC KALGOORLIE [50110]	WA	In buffer area only
Defence - AIRTC KALGOORLIE [50111]	WA	In buffer area only
Defence - KALGOORLIE RIFLE RANGE [50156]	WA	In buffer area only
Defence - KALGOORLIE TRAINING DEPOT [50199]	WA	In buffer area only
Defence - KALGOORLIE TRAINING DEPOT [50198]	WA	In buffer area only
Unknown		
Commonwealth Land - [51060]	WA	In buffer area only
Commonwealth Land - [51958]	WA	In buffer area only
Commonwealth Land - [51063]	WA	In buffer area only
Commonwealth Land - [51062]	WA	In buffer area only
Commonwealth Land - [51779]	WA	In buffer area only
Commonwealth Land - [51783]	WA	In buffer area only
Commonwealth Land - [51791]	WA	In buffer area only
Commonwealth Land - [51790]	WA	In buffer area only
Commonwealth Land - [51793]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51792]	WA	In buffer area only
Commonwealth Land - [51780]	WA	In buffer area only
Commonwealth Land - [51773]	WA	In buffer area only
Commonwealth Land - [51777]	WA	In buffer area only
Commonwealth Land - [51784]	WA	In buffer area only
Commonwealth Land - [51949]	WA	In buffer area only
Commonwealth Land - [51952]	WA	In buffer area only
Commonwealth Land - [52233]	WA	In buffer area only
Commonwealth Land - [51765]	WA	In buffer area only
Commonwealth Land - [51766]	WA	In buffer area only
Commonwealth Land - [52230]	WA	In buffer area only
Commonwealth Land - [51760]	WA	In buffer area only
Commonwealth Land - [51761]	WA	In buffer area only
Commonwealth Land - [51950]	WA	In buffer area only
Commonwealth Land - [51763]	WA	In buffer area only
Commonwealth Land - [51960]	WA	In buffer area only
Commonwealth Land - [51963]	WA	In buffer area only
Commonwealth Land - [51762]	WA	In buffer area only
Commonwealth Land - [51406]	WA	In buffer area only
Commonwealth Land - [50335]	WA	In buffer area only
Commonwealth Land - [51430]	WA	In buffer area only
Commonwealth Land - [50336]	WA	In buffer area only
Commonwealth Land - [50329]	WA	In buffer area only
Commonwealth Land - [50337]	WA	In buffer area only
Commonwealth Land - [51782]	WA	In buffer area only
Commonwealth Land - [51985]	WA	In buffer area only
Commonwealth Land - [51794]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51795]	WA	In buffer area only
Commonwealth Land - [51764]	WA	In buffer area only
Commonwealth Land - [51956]	WA	In buffer area only
Commonwealth Land - [51061]	WA	In buffer area only
Commonwealth Land - [50334]	WA	In buffer area only
Commonwealth Land - [51770]	WA	In buffer area only
Commonwealth Land - [52211]	WA	In buffer area only
Commonwealth Land - [51961]	WA	In buffer area only
Commonwealth Land - [51785]	WA	In buffer area only
Commonwealth Land - [52184]	WA	In buffer area only
Commonwealth Land - [50310]	WA	In buffer area only
Commonwealth Land - [51962]	WA	In buffer area only
Commonwealth Land - [51789]	WA	In buffer area only
Commonwealth Land - [51788]	WA	In buffer area only
Commonwealth Land - [51059]	WA	In buffer area only
Commonwealth Land - [50332]	WA	In buffer area only
Commonwealth Land - [50331]	WA	In buffer area only
Commonwealth Land - [51769]	WA	In buffer area only
Commonwealth Land - [51775]	WA	In buffer area only
Commonwealth Land - [51768]	WA	In buffer area only
Commonwealth Land - [51778]	WA	In buffer area only
Commonwealth Land - [51767]	WA	In buffer area only
Commonwealth Land - [51786]	WA	In buffer area only
Commonwealth Land - [51781]	WA	In buffer area only
Commonwealth Land - [50333]	WA	In buffer area only
Commonwealth Land - [51787]	WA	In buffer area only
Commonwealth Land - [52183]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51771]	WA	In buffer area only
Commonwealth Land - [51772]	WA	In buffer area only
Commonwealth Land - [51955]	WA	In buffer area only
Commonwealth Land - [51758]	WA	In buffer area only
Commonwealth Land - [51959]	WA	In buffer area only
Commonwealth Land - [51954]	WA	In buffer area only
Commonwealth Land - [51759]	WA	In buffer area only
Commonwealth Land - [51774]	WA	In buffer area only
Commonwealth Land - [51951]	WA	In buffer area only
Commonwealth Land - [51776]	WA	In buffer area only
Commonwealth Land - [51953]	WA	In buffer area only
Commonwealth Land - [51957]	WA	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat may occur within area overfly marine area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Burra	Conservation Park	WA	In buffer area only
Credo	NRS Addition - Gazettal in Progress	WA	In buffer area only
Goldfields Woodlands	Conservation Park	WA	In buffer area only
Goldfields Woodlands	National Park	WA	In buffer area only

Protected Area Name	Reserve Type	State	Buffer Status
Kalgoorlie Arboretum	5(1)(h) Reserve	WA	In buffer area only
Kambalda	Nature Reserve	WA	In buffer area only
Kangaroo Hills Timber Reserve	5(1)(g) Reserve	WA	In buffer area only
Kurrawang	Nature Reserve	WA	In buffer area only
Lakeside Timber Reserve	5(1)(g) Reserve	WA	In buffer area only
Scahill Timber Reserve	5(1)(g) Reserve	WA	In buffer area only
Victoria Rock	Nature Reserve	WA	In buffer area only
Yallari Timber Reserve	5(1)(h) Reserve	WA	In buffer area only

EPBC Act Referrals

[Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Goldfields Water Supply Scheme Project	2019/8547	Controlled Action	Post-Approval	In feature area
Nava-1 Cable System	2001/510	Controlled Action	Completed	In buffer area only
Not controlled action				
Focus, Greenfields and Carins Intersection Upgrade,Great Eastern Highway, WA	2014/7171	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Lynas Kalgoorlie Rare Earths Processing Facility	2020/8719	Not Controlled Action	Completed	In buffer area only
Sale of Post Office, Hannan Street	2006/3084	Not Controlled Action	Completed	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Atlas of Living Australia Datbase

Animalia	Amphibia	Goldfields Bullfrog
Animalia	Amphibia	Humming Frog
Animalia	Amphibia	Little Red Tree Frog
Animalia	Amphibia	Magnificent Tree Frog
Animalia	Amphibia	Orange-crowned Toadlet
Animalia	Amphibia	Shoemaker Frog
Animalia	Amphibia	Western Green And Golden Bell Frog
Animalia	Amphibia	Wheatbelt Frog
Animalia	Amphibia	White-lipped Tree Frog
Animalia	Aves	African Collared Dove
Animalia	Aves	Asian House Martin
Animalia	Aves	Australasian Darter
Animalia	Aves	Australasian Darter
Animalia	Aves	Australasian Grebe
Animalia	Aves	Australasian Shoveler
Animalia	Aves	Australian Bustard
Animalia	Aves	Australian Eurasian Coot
Animalia	Aves	Australian Hobby
Animalia	Aves	Australian Magpie
Animalia	Aves	Australian Owlet-nightjar
Animalia	Aves	Australian Pelican
Animalia	Aves	Australian Pipit
Animalia	Aves	Australian Raven
Animalia	Aves	Australian Ringneck
Animalia	Aves	Australian Shelduck
Animalia	Aves	Australian Spotted Crake
Animalia	Aves	Australian White Ibis
Animalia	Aves	Australian Wood Duck
Animalia	Aves	Banded Lapwing
Animalia	Aves	Banded Stilt
Animalia	Aves	Black Falcon
Animalia	Aves	Black Honeyeater
Animalia	Aves	Black Kite
Animalia	Aves	Black Swan
Animalia	Aves	Black-breasted Buzzard
Animalia	Aves	Black-capped Sittella
Animalia	Aves	Black-eared Cuckoo
Animalia	Aves	Black-faced Cuckoo-shrike
Animalia	Aves	Black-faced Woodswallow
Animalia	Aves	Black-fronted Dotterel
Animalia	Aves	Black-shouldered Kite
Animalia	Aves	Black-tailed Godwit
Animalia	Aves	Black-tailed Native-hen
Animalia	Aves	Black-winged Stilt
Animalia	Aves	Blue-billed Duck
Animalia	Aves	Blue-breasted Fairy-wren
Animalia	Aves	Brown Falcon
Animalia	Aves	Brown Goshawk
Animalia	Aves	Brown Honeyeater
Animalia	Aves	Brown Songlark
Animalia	Aves	Brown-headed Honeyeater
Animalia	Aves	Brush Bronzewing
Animalia	Aves	Budgerigar

Animalia	Aves	Bush Stone-curlew
Animalia	Aves	Cattle Egret
Animalia	Aves	Chestnut Quail-thrush
Animalia	Aves	Chestnut Teal
Animalia	Aves	Chestnut-breasted Quail-thrush
Animalia	Aves	Chestnut-rumped Thornbill
Animalia	Aves	Chiming Wedgebill
Animalia	Aves	Chinese Goshawk
Animalia	Aves	Coastal Spotted Pardalote
Animalia	Aves	Cockatiel
Animalia	Aves	Collared Sparrowhawk
Animalia	Aves	Common Bronzewing
Animalia	Aves	Common Greenshank
Animalia	Aves	Common Mallard
Animalia	Aves	Common Sandpiper
Animalia	Aves	Crested Bellbird
Animalia	Aves	Crested Pigeon
Animalia	Aves	Crested Shrike-tit
Animalia	Aves	Crimson Chat
Animalia	Aves	Crimson Rosella
Animalia	Aves	Curlew Sandpiper
Animalia	Aves	Diamond Dove
Animalia	Aves	Dirk Hartog White-winged Fairy-wren
Animalia	Aves	Dusky Grasswren
Animalia	Aves	Dusky Woodswallow
Animalia	Aves	Eastern Barn Owl
Animalia	Aves	Eastern Brown Falcon
Animalia	Aves	Eastern Cattle Egret
Animalia	Aves	Eastern Striated Pardalote
Animalia	Aves	Eastern White-browed Treecreeper
Animalia	Aves	Elegant Parrot
Animalia	Aves	Emu
Animalia	Aves	Eurasian Coot
Animalia	Aves	Fairy Martin
Animalia	Aves	Fan-tailed Cuckoo
Animalia	Aves	Freckled Duck
Animalia	Aves	Galah
Animalia	Aves	Gilbert's Whistler
Animalia	Aves	Glossy Ibis
Animalia	Aves	Golden Whistler
Animalia	Aves	Great Cormorant
Animalia	Aves	Great Crested Grebe
Animalia	Aves	Great Egret
Animalia	Aves	Great Egret
Animalia	Aves	Grey Butcherbird
Animalia	Aves	Grey Currawong
Animalia	Aves	Grey Falcon
Animalia	Aves	Grey Fantail
Animalia	Aves	Grey Shrike-thrush
Animalia	Aves	Grey Teal
Animalia	Aves	Grey-fronted Honeyeater
Animalia	Aves	Ground Cuckoo-shrike
Animalia	Aves	Hardhead
Animalia	Aves	Hoary-headed Grebe

Animalia	Aves	Hooded Plover
Animalia	Aves	Hooded Robin
Animalia	Aves	Horsfield's Bronze-cuckoo
Animalia	Aves	Indian Peafowl
Animalia	Aves	Inland Chestnut Quail-thrush
Animalia	Aves	Inland Grey Butcherbird
Animalia	Aves	Inland Western Rosella
Animalia	Aves	Inland Yellow-throated Miner
Animalia	Aves	Jacky Winter
Animalia	Aves	Laughing Turtle-dove
Animalia	Aves	Little Black Cormorant
Animalia	Aves	Little Button-quail
Animalia	Aves	Little Corella
Animalia	Aves	Little Crow
Animalia	Aves	Little Eagle
Animalia	Aves	Little Pied Cormorant
Animalia	Aves	Little Woodswallow
Animalia	Aves	Magpie-lark
Animalia	Aves	Mainland White-winged Fairy-wren
Animalia	Aves	Major Mitchell's Cockatoo
Animalia	Aves	Malayan Night-heron (ssp)
Animalia	Aves	Malleefowl
Animalia	Aves	Marsh Sandpiper
Animalia	Aves	Masked Woodswallow
Animalia	Aves	Mistletoebird
Animalia	Aves	Mulga Parrot
Animalia	Aves	Muscovy Duck
Animalia	Aves	Musk Duck
Animalia	Aves	Nankeen Kestrel
Animalia	Aves	Nankeen Night-heron
Animalia	Aves	New Holland Honeyeater
Animalia	Aves	Orange Chat
Animalia	Aves	Oriental Plover
Animalia	Aves	Pacific Black Duck
Animalia	Aves	Pallid Cuckoo
Animalia	Aves	Peaceful Dove
Animalia	Aves	Peregrine Falcon
Animalia	Aves	Pied Butcherbird
Animalia	Aves	Pied Honeyeater
Animalia	Aves	Pied Stilt
Animalia	Aves	Pink-eared Duck
Animalia	Aves	Port Lincoln Parrot
Animalia	Aves	Princess Parrot
Animalia	Aves	Purple-backed Fairy-wren
Animalia	Aves	Purple-crowned Lorikeet
Animalia	Aves	Purple-gaped Honeyeater
Animalia	Aves	Rainbow Bee-eater
Animalia	Aves	Red Junglefowl
Animalia	Aves	Red Wattlebird
Animalia	Aves	Red-backed Kingfisher
Animalia	Aves	Red-browed Pardalote
Animalia	Aves	Red-browed Treecreeper
Animalia	Aves	Red-capped Plover
Animalia	Aves	Red-capped Robin

Animalia	Aves	Red-kneed Dotterel
Animalia	Aves	Red-necked Avocet
Animalia	Aves	Red-necked Stint
Animalia	Aves	Red-rumped Tit
Animalia	Aves	Redthroat
Animalia	Aves	Regent Parrot
Animalia	Aves	Restless Flycatcher
Animalia	Aves	Rock Dove
Animalia	Aves	Rufous Fieldwren
Animalia	Aves	Rufous Songlark
Animalia	Aves	Rufous Treecreeper
Animalia	Aves	Rufous Whistler
Animalia	Aves	Sacred Kingfisher
Animalia	Aves	Sanderling
Animalia	Aves	Scarlet-chested Parrot
Animalia	Aves	Shark Bay Western Grasswren
Animalia	Aves	Sharp-tailed Sandpiper
Animalia	Aves	Shy Heathwren
Animalia	Aves	Silver Gull
Animalia	Aves	Silvereye
Animalia	Aves	Singing Honeyeater
Animalia	Aves	Slaty-backed Thornbill
Animalia	Aves	Slender-billed Thornbill
Animalia	Aves	South Australian Golden Whistler
Animalia	Aves	Southern Boobook
Animalia	Aves	Southern Boobook
Animalia	Aves	Southern Crested Bellbird
Animalia	Aves	Southern Inland Thornbill
Animalia	Aves	Southern Jacky Winter
Animalia	Aves	Southern Scrub-robin
Animalia	Aves	Southern Weebill
Animalia	Aves	Southern White-browed Babbler
Animalia	Aves	Southern Whiteface
Animalia	Aves	South-west Southern Whiteface
Animalia	Aves	South-western Australian Magpie
Animalia	Aves	South-western Dusky Woodswallow
Animalia	Aves	South-western Grey Currawong
Animalia	Aves	South-western New Holland Honeyeater
Animalia	Aves	South-western Spotted Scrubwren
Animalia	Aves	South-western Yellow Robin
Animalia	Aves	Spiny-cheeked Honeyeater
Animalia	Aves	Splendid Fairy-wren
Animalia	Aves	Spotted Harrier
Animalia	Aves	Spotted Nightjar
Animalia	Aves	Spotted Pardalote
Animalia	Aves	Spotted Turtle-dove
Animalia	Aves	Square-tailed Kite
Animalia	Aves	Straw-necked Ibis
Animalia	Aves	Striated Pardalote
Animalia	Aves	Striped Honeyeater
Animalia	Aves	Stubble Quail
Animalia	Aves	Swamp Harrier
Animalia	Aves	Tawny Frogmouth
Animalia	Aves	Tawny-crowned Honeyeater

Animalia	Aves	Torresian Crow
Animalia	Aves	Torresian Nankeen Night-heron
Animalia	Aves	Tree Martin
Animalia	Aves	Twenty-eight Parrot
Animalia	Aves	Varied Sittella
Animalia	Aves	Variegated Fairy-wren
Animalia	Aves	Wedge-tailed Eagle
Animalia	Aves	Weebill
Animalia	Aves	Welcome Swallow
Animalia	Aves	Western Australian Raven
Animalia	Aves	Western Bowerbird
Animalia	Aves	Western Brown-headed Honeyeater
Animalia	Aves	Western Corella
Animalia	Aves	Western Galah
Animalia	Aves	Western Gerygone
Animalia	Aves	Western Grasswren
Animalia	Aves	Western Grey Shrike-thrush
Animalia	Aves	Western Grey-fronted Honeyeater
Animalia	Aves	Western Hooded Robin
Animalia	Aves	Western Inland Thornbill
Animalia	Aves	Western Quail-thrush
Animalia	Aves	Western Red Wattlebird
Animalia	Aves	Western Regent Parrot
Animalia	Aves	Western Rosella
Animalia	Aves	Western Shrike-tit
Animalia	Aves	Western Spinebill
Animalia	Aves	Western Splendid Fairy-wren
Animalia	Aves	Western Striated Pardalote
Animalia	Aves	Western Thornbill
Animalia	Aves	Western Wattlebird
Animalia	Aves	Western Weebill
Animalia	Aves	Western Welcome Swallow
Animalia	Aves	Western White-eared Honeyeater
Animalia	Aves	Western Yellow Robin
Animalia	Aves	Whiskered Tern
Animalia	Aves	Whistling Kite
Animalia	Aves	White-backed Swallow
Animalia	Aves	White-browed Babbler
Animalia	Aves	White-browed Scrubwren
Animalia	Aves	White-browed Treecreeper
Animalia	Aves	White-browed Woodswallow
Animalia	Aves	White-cheeked Honeyeater
Animalia	Aves	White-eared Honeyeater
Animalia	Aves	White-faced Heron
Animalia	Aves	White-fronted Chat
Animalia	Aves	White-fronted Honeyeater
Animalia	Aves	White-naped Honeyeater
Animalia	Aves	White-necked Heron
Animalia	Aves	White-plumed Honeyeater
Animalia	Aves	White-throated Honeyeater
Animalia	Aves	White-winged Fairy-wren
Animalia	Aves	White-winged Triller
Animalia	Aves	Willie Wagtail
Animalia	Aves	Wood Sandpiper

Animalia	Aves	Yellow-billed Spoonbill
Animalia	Aves	Yellowhammer
Animalia	Aves	Yellow-plumed Honeyeater
Animalia	Aves	Yellow-rumped Thornbill
Animalia	Aves	Yellow-throated Miner
Animalia	Aves	Zebra Finch
Animalia	Mammalia	[black-faced Kangaroo]
Animalia	Mammalia	Ash-grey Mouse
Animalia	Mammalia	Bilby
Animalia	Mammalia	Bolam's Mouse
Animalia	Mammalia	Burrowing Bettong
Animalia	Mammalia	Cat
Animalia	Mammalia	Central Long-eared Bat
Animalia	Mammalia	Chocolate Wattled Bat
Animalia	Mammalia	Common Dog
Animalia	Mammalia	Common Wallaroo
Animalia	Mammalia	Eastern Wallaroo
Animalia	Mammalia	Fat-tailed Dunnart
Animalia	Mammalia	Gilbert's Dunnart
Animalia	Mammalia	Goat
Animalia	Mammalia	Gould's Wattled Bat
Animalia	Mammalia	Grey-bellied Dunnart
Animalia	Mammalia	Hairy-footed Dunnart
Animalia	Mammalia	House Mouse
Animalia	Mammalia	Inland Broad-nosed Bat
Animalia	Mammalia	Inland Forest Bat
Animalia	Mammalia	Inland Free-tailed Bat
Animalia	Mammalia	Kultarr
Animalia	Mammalia	Lesser Long-eared Bat
Animalia	Mammalia	Little Long-tailed Dunnart
Animalia	Mammalia	Mitchell's Hopping-mouse
Animalia	Mammalia	Numbat
Animalia	Mammalia	One-humped Camel
Animalia	Mammalia	Ooldea Dunnart
Animalia	Mammalia	Platypus
Animalia	Mammalia	Rabbit
Animalia	Mammalia	Sandy Inland Mouse
Animalia	Mammalia	Short-beaked Echidna
Animalia	Mammalia	Southern Forest Bat
Animalia	Mammalia	Southern Ningaui
Animalia	Mammalia	South-western Free-tailed Bat
Animalia	Mammalia	Spinifex Hopping-mouse
Animalia	Mammalia	Western Chestnut Mouse
Animalia	Mammalia	Western Grey Kangaroo
Animalia	Mammalia	Western Pygmy-possum
Animalia	Mammalia	White-striped Freetail-bat
Animalia	Mammalia	Wongai Ningaui
Animalia	Reptilia	Bardick
Animalia	Reptilia	Barking Gecko
Animalia	Reptilia	Beaded Gecko
Animalia	Reptilia	Beaked Blind Snake
Animalia	Reptilia	Bicycle Lizard
Animalia	Reptilia	Black-headed Monitor
Animalia	Reptilia	Black-naped Snake

Animalia	Reptilia	Bright Crevice-skink
Animalia	Reptilia	Broad-banded Sand-swimmer
Animalia	Reptilia	Brooks Ctenotus
Animalia	Reptilia	Buchananâ€™s Snake-eyed Skink
Animalia	Reptilia	Burton's Snake-lizard
Animalia	Reptilia	Bynoe's Gecko
Animalia	Reptilia	Central Netted Dragon
Animalia	Reptilia	Centralian Dtella
Animalia	Reptilia	Claypan Dragon
Animalia	Reptilia	Common Scaly-foot
Animalia	Reptilia	Curl Snake
Animalia	Reptilia	Dark-spined Blind Snake
Animalia	Reptilia	Desert Banded Snake
Animalia	Reptilia	Desert Death Adder
Animalia	Reptilia	Desert Skink
Animalia	Reptilia	Dugite
Animalia	Reptilia	Dwarf Bearded Dragon
Animalia	Reptilia	Dwarf Bearded Dragon
Animalia	Reptilia	Eastern Slender Blue-tongue
Animalia	Reptilia	Fat-tailed Diplodactylus
Animalia	Reptilia	Fine-faced Gecko
Animalia	Reptilia	Fraser's Delma
Animalia	Reptilia	Gascoyne Pebble-mimic Dragon
Animalia	Reptilia	Gibber Earless Dragon
Animalia	Reptilia	Goldfields Crevice-skink
Animalia	Reptilia	Goldfields Pebble-mimic Dragon
Animalia	Reptilia	Goldfields Spiny-tailed Gecko
Animalia	Reptilia	Gould's Goanna
Animalia	Reptilia	Gould's Hooded Snake
Animalia	Reptilia	Grey's Menetia
Animalia	Reptilia	House Gecko
Animalia	Reptilia	Jan's Banded Snake
Animalia	Reptilia	Jewelled Gecko
Animalia	Reptilia	Leonhardi's Ctenotus
Animalia	Reptilia	Lowlands Earless Skink
Animalia	Reptilia	Lozenge-marked Dragon
Animalia	Reptilia	Main's Ground Gecko
Animalia	Reptilia	Mallee Dragon
Animalia	Reptilia	Mallee Military Dragon
Animalia	Reptilia	Marbled Gecko
Animalia	Reptilia	Marbled Velvet Gecko
Animalia	Reptilia	Marble-faced Delma
Animalia	Reptilia	Midline Knob-tail
Animalia	Reptilia	Mitchell's Short-tailed Snake
Animalia	Reptilia	Monk Snake
Animalia	Reptilia	Moon Snake
Animalia	Reptilia	Mulga Dragon
Animalia	Reptilia	Mulga Snake
Animalia	Reptilia	Nocturnal Desert-skink
Animalia	Reptilia	Northern Brown Snake
Animalia	Reptilia	Northern Snake-necked Turtle
Animalia	Reptilia	Ornate Dragon
Animalia	Reptilia	PÃ©ron's Snake-eyed Skink
Animalia	Reptilia	Painted Dragon

Animalia	Reptilia	Pale-flecked Garden Sunskink
Animalia	Reptilia	Pale-headed Blind Snake
Animalia	Reptilia	Pebble Dragon
Animalia	Reptilia	Prong-snouted Blind Snake
Animalia	Reptilia	Purplish Dtella
Animalia	Reptilia	Pygmy Spiny-tailed Skink
Animalia	Reptilia	Reticulated Velvet Gecko
Animalia	Reptilia	Rich Ctenotus
Animalia	Reptilia	Ringed Brown Snake
Animalia	Reptilia	Ring-tailed Dragon
Animalia	Reptilia	Rosen's Snake
Animalia	Reptilia	Saltbush Morethia Skink
Animalia	Reptilia	Sand-plain Worm-lizard
Animalia	Reptilia	Schomburgk's Ctenotus
Animalia	Reptilia	Shingle-back
Animalia	Reptilia	Shrubland Morethia Skink
Animalia	Reptilia	Smooth Knob-tail
Animalia	Reptilia	Southern Blind Snake
Animalia	Reptilia	Southern Mallee Ctenotus
Animalia	Reptilia	Southern Robust Slider
Animalia	Reptilia	Southern Sand-skink
Animalia	Reptilia	Southern Shovel-nosed Snake
Animalia	Reptilia	South-western Clawless Gecko
Animalia	Reptilia	Southwestern Earless Skink
Animalia	Reptilia	Spotted Ctenotus
Animalia	Reptilia	Stripe-tailed Monitor
Animalia	Reptilia	Thorny Devil
Animalia	Reptilia	Timid Slider
Animalia	Reptilia	Tree Dtella
Animalia	Reptilia	Unbanded Delma
Animalia	Reptilia	Western Beaked Gecko
Animalia	Reptilia	Western Blue-tongue
Animalia	Reptilia	Western Brown Snake
Animalia	Reptilia	Western Carpet Python
Animalia	Reptilia	Western Fat-tailed Gecko
Animalia	Reptilia	Western Hooded Scaly-foot
Animalia	Reptilia	Western Limestone Ctenotus
Animalia	Reptilia	Western Netted Dragon
Animalia	Reptilia	Western Spiny-tailed Skink
Animalia	Reptilia	Western Stone Gecko
Animalia	Reptilia	Wheat-belt Stone Gecko
Animalia	Reptilia	Wood Mulch-slider
Animalia	Reptilia	Woodland Morethia Skink
Animalia	Reptilia	Yellow-faced Whip Snake
Animalia	Reptilia	Yellow-lipped Sea Krait

Appendix 3: Fauna Habitat Assessment Examples

FAUNA HABITAT ASSESSMENT SHEET										
Location:	South Coolgardie Project (HA7)									
Survey Dates:	October 3rd 2024									
Easting:	325775				Northing:	6569198				
Aspect	SE				Soil Texture	Stoney				
Fauna Habitat Type: MIXED EUCALYPTUS WOODLAND					Average Height	Cover (tick)				
Stratum						Scattered Plants	Sparse	Moderate	Thick	
Overstorey	*E. graffithsii, E. torquate*				12	✓				
Midstorey	*Eremophila and Senna*				1.5	✓				
Ground Cover	Mixed hebs and grasses				0.5	✓				
CONDITION						LAST FIRE				
Excellent	Very Good	Good	Degraded	Completely Degraded		<1 year	1 -3 Yr	4-5 Yr	>5 Yr	
Notes:										
(general)			DISTURBANCE			(cattle)				
Heavy	Medium	Mild	None	None		Heavy	Medium	Mild	None	
Notes: Mining										
GROUND COVER										
Bare Ground (%)	<5	<20	20-60	60-100		Hummock Grass (%)	<5	<20	20-60	60-100
Rock (%)	<5	<20	20-60	60-100		Other Grass (%)	<5	<20	20-60	60-100
Leaf Litter (%)	<5	<20	20-60	60-100		Herbs (%)	<5	<20	20-60	60-100
Hollow logs (%)	<5	<20	20-60	60-100		Other:(%)	<5	<20	20-60	60-100
MICROHABITATS										
Burrowing Suitability (%)	Rock	Stoney	Sandy Loam	Sand		Peeling Bark	None	Rare	Moderate	Common
Pebbles Stones (%)	<5	<20	20-60	60-100		Hollows	None	Rare	Moderate	Common
Exfoliating Slabs (%)	<5	<20	20-60	60-100		Water Prescence	None	Rare	Moderate	Common
Rock Crevices (%)	<5	<20	20-60	60-100		Distance to Water	>5km	2-5km	500m - 2km	<500m
Boulders (%)	<5	<20	20-60	60-100		Termite Mounds	None	Rare	Moderate	Common
Caves	Absent		Present			Woody Debris	None	Rare	Moderate	Common
Fauna										
Species recorded	Grey Shrike-thrush, Crested Bellbird									
Potential threatened fauna species	Malleefowl									
Threatened fauna habitat	Suitable Malleefowl foraging habitat. Unsuitable Malleefowl breeding habitat, due to a lack of dense shrubland and canopy to provide shelter for mounds									

FAUNA HABITAT ASSESSMENT SHEET										
Location:	South Coolgardie Project (HA4)									
Survey Dates:	October 3rd 2024									
Easting:	328317				Northing:	6571365				
Aspect	S				Soil Texture	Stoney				
Fauna Habitat Type: SALMON GUM WOODLAND					Average Height	Cover (tick)				
Stratum						Scattered Plants	Sparse	Moderate	Thick	
Overstorey	*E. salmonophila*				12	✓				
Midstorey	*Eremophila*				1.5	✓				
Ground Cover	Mixed hebs and grasses				0.5	✓				
CONDITION						LAST FIRE				
Excellent	Very Good	Good	Degraded	Completely Degraded		<1 year	1 -3 Yr	4-5 Yr	>5 Yr	
Notes:										
(general)			DISTURBANCE			(cattle)				
Heavy	Medium	Mild	None	None		Heavy	Medium	Mild	None	
Notes: Mining										
GROUND COVER										
Bare Ground (%)	<5	<20	20-60	60-100		Hummock Grass (%)	<5	<20	20-60	60-100
Rock (%)	<5	<20	20-60	60-100		Other Grass (%)	<5	<20	20-60	60-100
Leaf Litter (%)	<5	<20	20-60	60-100		Herbs (%)	<5	<20	20-60	60-100
Hollow logs (%)	<5	<20	20-60	60-100		Other:(%)	<5	<20	20-60	60-100
MICROHABITATS										
Burrowing Suitability (%)	Rock	Stoney	Sandy Loam	Sand		Peeling Bark	None	Rare	Moderate	Common
Pebbles Stones (%)	<5	<20	20-60	60-100		Hollows	None	Rare	Moderate	Common
Exfoliating Slabs (%)	<5	<20	20-60	60-100		Water Prescence	None	Rare	Moderate	Common
Rock Crevices (%)	<5	<20	20-60	60-100		Distance to Water	>5km	2-5km	500m - 2km	<500m
Boulders (%)	<5	<20	20-60	60-100		Termite Mounds	None	Rare	Moderate	Common
Caves	Absent		Present			Woody Debris	None	Rare	Moderate	Common
Fauna										
Species recorded	Crested Bellbird									
Potential threatened fauna species	Malleefowl									
Threatened fauna habitat	Suitable Malleefowl foraging habitat. Unsuitable Malleefowl breeding habitat, due to a lack of dense shrubland and canopy to provide shelter for mounds									

FAUNA HABITAT ASSESSMENT SHEET									
Location:	South Coolgardie (HA11)								
Survey Dates:	October 3rd 2024								
Easting:	326549				Northing:	6569429			
Aspect	N				Soil Texture	Rocky/stoney			
Fauna Habitat Type: ACACIA SHRUBLAND					Average Height	Cover (tick)			
Stratum						Scattered Plants	Sparse	Moderate	Thick
Overstorey	*Mixed Acacia*				2.5			✓	
Midstorey									
Ground Cover	Mixed hebs and grasses				0.5	✓			
CONDITION						LAST FIRE			
Excellent	Very Good	Good	Degraded	Completely Degraded		<1 year	1 -3 Yr	4-5 Yr	>5 Yr
Notes:									
(general)			DISTURBANCE			(cattle)			
Heavy	Medium		Mild			Heavy	Medium	Mild	None
Notes: Mining									
GROUND COVER									
Bare Ground (%)	<5	<20	20-60	60-100		Hummock Grass (%)	<5	<20	20-60	60-100
Rock (%)	<5	<20	20-60	60-100		Other Grass (%)	<5	<20	20-60	60-100
Leaf Litter (%)	<5	<20	20-60	60-100		Herbs (%)	<5	<20	20-60	60-100
Hollow logs (%)	<5	<20	20-60	60-100		Other:(%)	<5	<20	20-60	60-100
MICROHABITATS									
Burrowing Suitability (%)	Rock	Stoney	Sandy Loam	Sand		Peeling Bark	None	Rare	Moderate	Common
Pebbles Stones (%)	<5	<20	20-60	60-100		Hollows	None	Rare	Moderate	Common
Exfoliating Slabs (%)	<5	<20	20-60	60-100		Water Prescence	None	Rare	Moderate	Common
Rock Crevices (%)	<5	<20	20-60	60-100		Distance to Water	>5km	2-5km	500m - 2km	<500m
Boulders (%)	<5	<20	20-60	60-100		Termite Mounds	None	Rare	Moderate	Common
Caves	Absent		Present			Woody Debris	None	Rare	Moderate	Common
Fauna									
Species recorded	Splendid Fairy-wren, Masked Woodswallow								
Potential threatened fauna species	Malleefowl								
Threatened fauna habitat	Suitable Malleefowl foraging habitat. Unsuitable Malleefowl breeding habitat - the Acacia provides some areas of dense vegetation to provide adequate shelter, however the rocky substrate is too hard and generally too steep for Malleefowl to build mounds. In addition there is a lack of leaf litter available for mound construction.								

FAUNA HABITAT ASSESSMENT SHEET										
Location:	South Coolgardie Project (HA6)									
Survey Dates:	October 3rd 2024									
Easting:	328032				Northing:	6570014				
Aspect	SE				Soil Texture	Sandy Loam				
Fauna Habitat Type: DRAINAGE AREA					Average Height	Cover (tick)				
Stratum						Scattered Plants	Sparse	Moderate	Thick	
Overstorey	*E. graffithsii, E. torquate*				12	✓				
Midstorey	*Mixed Acaia*				1.5	✓				
Ground Cover	Mixed grasses				0.5	✓				
CONDITION						LAST FIRE				
Excellent	Very Good	Good	Degraded	Completely Degraded		<1 year	1 -3 Yr	4-5 Yr	>5 Yr	
Notes:										
(general)			DISTURBANCE			(cattle)				
Heavy	Medium	Mild	None	None		Heavy	Medium	Mild	None	
Notes: Mining										
GROUND COVER										
Bare Ground (%)	<5	<20	20-60	60-100		Hummock Grass (%)	<5	<20	20-60	60-100
Rock (%)	<5	<20	20-60	60-100		Other Grass (%)	<5	<20	20-60	60-100
Leaf Litter (%)	<5	<20	20-60	60-100		Herbs (%)	<5	<20	20-60	60-100
Hollow logs (%)	<5	<20	20-60	60-100		Other:(%)	<5	<20	20-60	60-100
MICROHABITATS										
Burrowing Suitability (%)	Rock	Stoney	Sandy Loam	Sand		Peeling Bark	None	Rare	Moderate	Common
Pebbles Stones (%)	<5	<20	20-60	60-100		Hollows	None	Rare	Moderate	Common
Exfoliating Slabs (%)	<5	<20	20-60	60-100		Water Prescence	None	Rare	Moderate	Common
Rock Crevices (%)	<5	<20	20-60	60-100		Distance to Water	>5km	2-5km	500m - 2km	<500m
Boulders (%)	<5	<20	20-60	60-100		Termite Mounds	None	Rare	Moderate	Common
Caves	Absent		Present			Woody Debris	None	Rare	Moderate	Common
Fauna										
Species recorded	Hooded Robin, White-browed Babbler									
Potential threatened fauna species	Malleefowl									
Threatened fauna habitat	Suitable Malleefowl foraging habitat. Unsuitable Malleefowl breeding habitat, due to a possibility of flooding									

360 environmental | Part of SLR

CNX Three Mile Hill
Coolgardie Gold Project

Biological Surveys

Prepared for

Focus Minerals Limited

June 2022

people • planet • professional

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Executive Summary

Focused Mineral Limited commissioned 360 Environmental (part of SLR Consulting) to undertake a detailed flora and vegetation survey and basic vertebrate fauna and habitat survey at selected sites within the Three Mile Mine Project, Coolgardie. The Survey Area consists of four defined survey areas adjacent to the townsite of Coolgardie, Western Australia, and covers approximately 1360.72 ha.

The purpose of the assessment was to identify key biological values to inform decisions regarding the specific lease areas for proposed construction sites within the Survey Area.

Flora and Vegetation

The flora desktop assessment identified 90 conservation significant taxa occurring within 50 km of the Survey Area, including three Threatened taxa (*Gastrolobium graniticum, Tetratheca spenceri* and *Thelymitra stellata*). A pre-survey likelihood of occurrence assessment was undertaken and determined 20 taxa as having a high likelihood of occurrence, 18 taxa as having a medium likelihood of occurrence, and 51 taxa as having a low likelihood of occurrence. Following the survey, two taxa retained a high likelihood of occurrence.

The detailed flora and vegetation survey was undertaken in between the 11 - 15 October 2021 (Trip 1) and 15 - 19 November 2021 (Trip 2), with the survey recording the floristic composition and vegetation types from 74 quadrats, 22 relevés and 91 mapping notes. A total of 149 taxa were recorded from 78 genera across 35 families.

No Threatened flora taxa pursuant to the Environment Protection and Biodiversity Conservation Act 1999 and/or gazetted as Threatened pursuant to the Biodiversity and Conservation Act 2016 were recorded during the survey.

One Priority listed flora taxon was identified; a single population of *Austrostipa blackii* (P3) consisting of approximately 10 individuals was recorded within a single quadrat. The vegetation it was recorded in was heavily surveyed and no further populations were recorded.

Thirteen introduced taxa were recorded in the Survey Area, of which one, the Common Prickly Pear (**Opuntia stricta*) is listed as a Declared Pest, and a Weed of National Significance.

Ten vegetation types were described and mapped within the Survey Area. Vegetation in the Survey Area was representative of existing broad scale vegetation, as a well as soil and land system mapping for the area.

Vegetation condition ranged from Excellent to Completely Degraded with the majority considered to be in Excellent condition. Evidence of disturbance across the Survey Area included mine works, cattle grazing, vehicle tracks, weeds, and litter.

Vertebrate Fauna

The fauna desktop assessment identified 20 conservation significant species occurring within 50 km of the Coolgardie Survey Area comprising 17 bird species and 3 mammal species.

Fauna habitat mapping was undertaken based on a combination of aerial imagery, field observations and fauna habitat assessment data. Five fauna habitats were mapped within the Survey Area, of which the *Eucalyptus* Woodland and the *Acacia* Shrubland habitat types represent the most value to conservation significant fauna and overall fauna assemblage.

The basic terrestrial vertebrate fauna survey was undertaken in between the 11 – 15 October 2021 (Trip 1) and 15 – 19 November 2021 (Trip 2). This is considered suitable timing to survey for birds, mammals, reptiles, and summer breeding amphibians, but outside the optimal survey period for autumn and winter breeding amphibians. A total of 61 fauna taxa from 33 families comprising of: 42 birds from 21 families, ten mammals from seven families and nine reptiles from five families. No amphibian taxa were recorded.

One conservation significant taxon, the Western Quoll, Chuditch (*Dasyurus geoffroii fortis*) which is listed as Vulnerable under the Biodiversity Conservation Act and Environment Protection and Biodiversity Conservation Act, was recorded within the Survey Area. Chuditch scat was observed during the field survey.

Seven introduced mammal taxa were recorded during the survey, Goat (*Capra hircus*), European Cattle (*Bos primigenius taurus*), Dog/Dingo (*Canis familiaris*), Red Fox (*Vulpes vulpes*), Horse (*Equus caballus*), Cat (*Felis catus*) and Rabbit (*Oryctolagus cuniculus*).

Although outside the scope of this report, potential habitat for Arid Bronze Azure Butterfly (*Ogyris subterrestris petrina*), which is listed as Critically Endangered under the Biodiversity Conservation Act and Environment Protection and Biodiversity Conservation Act, and the Inland Hairstreak butterfly (*Jalmenus aridus*), which is listed as Priority 1 by the Department of Biodiversity, Conservation and Attractions, was observed within the Survey Area.

Abbreviations

Abbreviations used through the report are described below in Table 1.

Table 1: Abbreviations

Abbreviation	Description
BAM Act	Biosecurity and Agriculture Management Act 2007
BC Act	Biodiversity Conservation Act 2016
BoM	Bureau of Meteorology
CD	Conservation Dependent Fauna
CR	Critically Endangered
DAWE	Department of Agriculture, Water, and the Environment
DBCA	Department of Biodiversity, Conservation and Attractions
DoE	Department of Environment
DP	Declared Pest
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EN	Endangered
EP Act	Environmental Protection Act 1986
EPA	Environmental Protection Authority
EPBC Act	Environment Protection Biodiversity and Conservation Act 1999
ESA	Environmentally Sensitive Area
FML	Focus Minerals Limited
GDE	Groundwater Dependent Ecosystem
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
MI	Migratory
MNES	Matters of National Environmental Significance
NVIS	National Vegetation Information System
OS	Other Specially Protected Fauna
P	Priority
PEC	Priority Ecological Community
PMST	Protected Matters Search Tool
T	Threatened
TEC	Threatened Ecological Community
TPFL	Threatened and Priority Flora Database
VU	Vulnerable
WAH	Western Australian Herbarium

Abbreviation	Description
WAM	Western Australian Museum
WoNS	Weeds of National Significance

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1 Introduction

1.1 The Project

Focus Mineral Limited (FML) commissioned 360 Environmental (part of SLR Consulting) to undertake a detailed flora, vegetation, and basic terrestrial vertebrate fauna assessment to support the environmental and planning approvals for proposed expansions to the FML mining operation in Coolgardie Western Australia (the Project).

The 1360.72 ha FML Coolgardie (the Survey Area) is located approximately 40 km southwest of Kalgoorlie in the Coolgardie bioregion of Western Australia. The Survey Area includes multiple polygons representing potential deposits, waste pits, haul roads, and associated infrastructure.

1.2 Objectives and Scope

The purpose of the biological survey was to delineate key flora, vegetation and terrestrial vertebrate fauna values within the Survey Area and identify potential environmental sensitivities that may impact The Project.

The scope of works includes:

- Undertake a desktop assessment including relevant database searches and a literature review to compile and summarise existing records of flora, vegetation, and terrestrial vertebrate fauna (including conservation significant species and communities) within the vicinity of the Survey Area
- Undertake a detailed flora and vegetation survey in accordance with EPA Technical Guidance (Environmental Protection Authority, 2016)
- Undertake targeted searching for flora of conservation significance within the Survey Area
- Undertake a basic terrestrial vertebrate fauna survey in accordance with EPA Technical Guidance (Environmental Protection Authority, 2020)
- Identify and assess conservation significant terrestrial vertebrate fauna or suitable conservation significant terrestrial vertebrate fauna habitat potentially occurring within the Survey Area
- Produce a technical report based on the findings of the above
- Supply a geospatial data package prepared in accordance with IBSA requirements.

This report presents the outcomes of the FML Coolgardie flora, vegetation, and terrestrial vertebrate fauna assessment undertaken to support the above objectives.

2 Background

2.1 Protection of Flora, Vegetation and Fauna

Western Australian flora and fauna is protected formally and informally by legislative and non-legislative measures:

Legislative measures:

- *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *WA Biodiversity Conservation Act 2016* (BC Act)
- *WA Environmental Protection Act 1986* (EP Act)
- *WA Biosecurity and Agriculture Management Act 2007* (BAM Act).

Non-legislative measures:

- WA Department of Biodiversity Conservation and Attractions (DBCA) Priority lists for fauna, flora, and ecological communities
- Weeds of National Significance (WoNS)
- Recognition of locally significant populations by DBCA.

These protection mechanisms are supported by guidance documents published by the Environmental Protection Authority (EPA) and Department of Agriculture, Water, and the Environment (DAWE):

- *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (Environmental Protection Authority, 2016)
- *Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (Environmental Protection Authority, 2020)
- *Matters of National Environmental Significance Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (Department of the Environment, 2013)
- *Survey Guidelines for Australia's Threatened Mammals* (Department of Sustainability Environment Population and Communities, 1999)
- *Survey Guidelines for Australia's Threatened Reptiles* (Department of Sustainability Environment Water Population and Communities, 2011)
- *Survey Guidelines for Australia's Threatened Birds Under the Environment Protection And Biodiversity Conservation Act 1999* (Department of the Environment Water Heritage and the Arts, 2010).

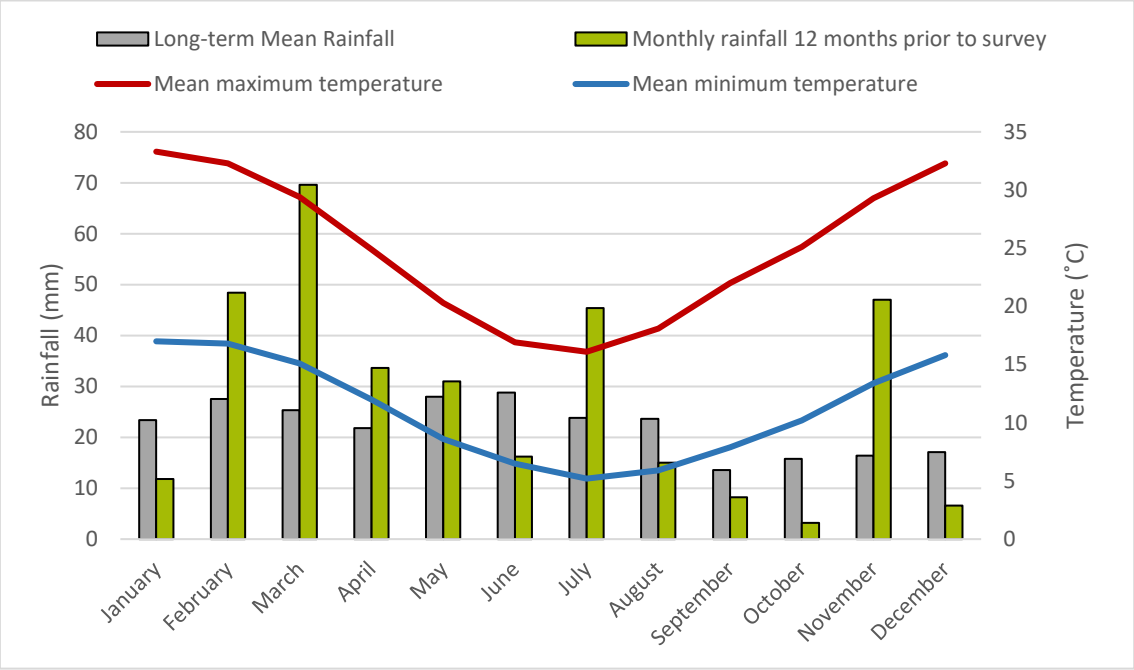
2.2 Existing Environment

2.2.1 Climate

The closest long-term Bureau of Meteorology weather station with a complete dataset is Coolgardie weather station (Station 012018) for climate data (i.e. temperature) and Koorarawalyee weather station (Station 012152) for rainfall data. The Coolgardie weather station is located approximately 75 km south of the Survey Area. Koorarawalyee weather station is located approximately 124 km southwest of the Survey Area.

The long-term mean minimum temperature for Coolgardie Weather Station ranges from 5.2˚C (July) to 16.8˚C (February) (1893 to 2020) and the long-term mean maximum temperature ranges from 16.1˚C (July) to 33.3˚C (January) (Graph 1) (Bureau of Meteorology, 2021).

The Koorarawalyee weather station recorded 336 mm of rainfall in the 12 months prior to the survey (October 2021 to November 2021), which is 66.4 mm above the long-term average of 269.6 for the same period (Bureau of Meteorology, 2021). In the three months prior to the survey (July 2021 to September 2021), 68.6 mm of rainfall was recorded, which is 7.6 mm above the long-term average of 61 mm for the same period (Bureau of Meteorology, 2021).



Graph 1: Long term and 2021 monthly weather and climate data for Coolgardie and Koorarawalyee

2.2.2 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical, and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (Department of the Environment and Energy, 2016). The Survey Area occurs within the Coolgardie bioregion and Eastern Goldfield (COO3) subregion.

The Eastern Goldfield (COO3) subregion lies on the Yilgarn Cratons 'Eastern Goldfields Terrains'. The relief is subdued and comprises of gently undulating plains interrupted in the west with low hills and ridges of Archaean greenstones and in the east by a horst of Proterozoic basic granulite.

2.2.3 Soils and Land Systems

Soil landscapes and land system mapping of Western Australia describes broad soil and landscape characteristics from regional to local scales, ranging from 1:20,000 to 1:250,000 (Department of Primary Industries and Regional Development, 2018). The Survey Area occurs entirely within the BB5 land system, characterised by rocky ranges and hills of greenstones with basic igneous rocks as well as sandplains with brown calcareous loam (Figure 2) (Department of Primary Industries and Regional Development, 2018).

2.2.4 Hydrography

The Survey Area contains one small-permanent pool which is just south of Coolgardie-Esperance Highway, named Coolgardie Gorge. The Survey Area also contains four decommissioned deep abandoned mining pits which contain water and several minor watercourses that don't influence vegetation types present. The nearest major hydro geographical feature is a seasonally filled salt lake approximately 6 km east of the Survey area. The salt lake joins the Red, White and Douglas lakes as part of a larger interconnected salt lake system, which flows in a south westerly direction (Figure 2) (Department of Water and Environmental Regulation, 2018).

2.2.5 Broad Vegetation Types

Mapping of pre-European vegetation in Western Australia was completed on a broad scale (1:1,000,000) by Beard, (1976). These vegetation types were later refined by Shepherd, Beeston and Hopkins, (2002) resulting in 819 vegetation types.

Two broad vegetation associations are mapped over the Survey Area (Figure 3). Representation of the vegetation associations at a local, regional, and state level is shown in Table 2.

- **Coolgardie 9 –** Medium woodland; Eucalyptus woodland / Eremophila sparse shrubland. Associated species are coral gum (*Eucalyptus torquata*) and goldfields blackbutt (*E. lesouefii*)
- **Coolgardie 1294 –** Eucalyptus woodland. Wheatbelt; York gum, salmon gum etc. (*Eucalyptus loxophleba*, *E. salmonophloia*). Goldfields; gimlet, redwood etc. (*E. salubris*, *E. oleosa*). Riverine; rivergum (*E. camaldulensis*). Tropical; messmate, woolybush.

Table 2: Broad Vegetation Types within the Survey Area and their Representation at the State, Regional and Local Levels (Government of Western Australia, 2019)

System and Vegetation Association	Extent			
	Pre-European (ha)	Current (ha)	Remaining (%)	Managed in DBCA Lands (%)*
Representation across Western Australia				
9	240,509.33	235,161.94	97.78	8.07
1294	6,295.55	6,047.45	96.06	1.90
Representation across the Coolgardie Bioregion				
9	240,441.99	235,100.97	97.78	8.07
1294	6,295.55	6,047.45	96.06	1.90
Representation across the Eastern Goldfields Subregion				
9	235,047.15	229,757.07	97.75	8.26
1294	6,295.55	6,047.45	96.06	1.90
Representation across the Shire of Coolgardie				
9	166,572.37	163,720.39	98.29	9.81
1294	3,385.95	3,378.94	99.79	3.40

*as a portion of the current extent

2.2.6 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs) or significant wetlands.

The Survey Area does not occur within a mapped ESA. The nearest ESA is the Rowles Lagoon Conservation Park located approximately 52 km north-west of the Survey Area (Department of Water and Environmental Regulation, 2020).

2.2.7 Conservation Areas

The Survey Area is not located within any listed conservation area (Department of Biodiversity Conservation and Attractions, 2021a). The nearest conservation area is the Kangaroo Hills Timber Reserve which is situated adjacent to the southernmost section of the Survey Area separated by Nepean Road (Figure 4).

2.2.8 Land Use

The dominant land use of the Eastern Goldfields subregion include: Unoccupied Crown Land (UCL) and Crown reserves, Grazing-Native pastures-leasehold, freehold, conservation, and Mining leases (Cowan, 2001).

The Survey Area covers sections of land classified as: mining lease, prospecting licence, and miscellaneous licence (Data WA, 2021). The Survey Area has a long history of mining activities, with extensive mine diggings including deep open pits and deep localised mine shafts.

3 Methods

3.1 Desktop Assessment

3.1.1 Literature Review

Background information on the Survey Area and surrounds was compiled prior to the field survey (see Section 3.1.1). Historical vegetation mapping (Beard, 1976; Shepherd, Beeston and Hopkins, 2002), land systems mapping (Department of Agriculture and Food WA, 2012), and the IBRA classification system (Cowan, 2001) were consulted to provide broad contextual knowledge of the vegetation units and habitat likely to be encountered within the Survey Area.

The literature review also considered a selection of biological reports detailing assessments undertaken in the region that were publicly available:

- Coolgardie Landfill - Flora, vegetation and fauna habitat assessment (Strategen Environmental, 2019)
- Fauna survey for Mungari Gold Operations Cutters Ridge Project (Phoenix Environmental Sciences, 2019)
- Flora and Vegetation Impact Assessment - Medcalf Project (Botanica Consulting, 2020)
- Level 1 Vertebrate Fauna Risk Assessment for Lot 500 Kalgoorlie West (Terrestrial Ecosystems, 2018)
- Reconnaissance Flora and Vegetation Survey for the Mt Marion Project Area (Native Vegetation Solutions, 2019)
- Reconnaissance Flora and Vegetation Survey of Lot 500 Great Eastern Highway Kalgoorlie (Native Vegetation Solutions, 2018)
- Reconnaissance Flora and Vegetation Survey of the Spargos Project - October 2020 (Native Vegetation Solutions, 2020)
- Vegetation Clearing - Fauna Assessment (Davyhurst, Callion, Waihi, Siberia, Riverina Clearance Areas) (Biostat Pty Ltd, 2020).

3.1.2 Database Searches

Database searches were undertaken to compile a list of potential flora and fauna and identify potential conservation significant flora, fauna, and ecological communities within or surrounding the Survey Areas (Table 3). In addition, an EPBC Protected Matters Search (PMST) was undertaken to identify the potential for Matters of National Environmental Significance (MNES) to occur within or surrounding the Survey Areas (Department of Agriculture Water and the Environment, 2020).

The search area for each parameter was varied to reflect distances recommended by DBCA. The search areas are herein referred to collectively as the Study Area.

Table 3 Database Searches of the Survey Area

Database Name	Date Received	Search Target	Search Area
Threatened and Priority Ecological Communities database search (Department of Biodiversity Conservation and Attractions, 2022)	7 October 2021	TECs and PECs	50 km buffer around the Survey Area
Threatened and Priority Flora (TPFL) database search (Department of Biodiversity Conservation and Attractions, 2021d)	7 October 2021	Threatened and Priority Flora	60 km buffer around the Survey Area
Western Australian Herbarium flora database search (Department of Biodiversity Conservation and Attractions, 2021e)			60 km buffer around the Survey Area
DBCA Threatened and Priority Fauna database search (Department of Biodiversity Conservation and Attractions, 2021c)	18 October 2021	Threatened and Priority Fauna	50 km buffer around Survey Area
NatureMap (Department of Biodiversity Conservation and Attractions, 2021b)	27 October 2021 (flora) 02 November 2021 (fauna)	Threatened and Priority flora and fauna, and inventory of potential flora and fauna	20 km buffer around the Survey Area (flora) 40 km buffer around Survey Area (fauna)
Protected Matters Search Tool (PMST) (Department of Agriculture Water and the Environment, 2021a)	25 October 2021	Commonwealth listed Threatened flora and fauna and TECs	50 km buffer around the Survey Area

3.1.3 Likelihood of Occurrence

Conservation significant flora and fauna species identified from the desktop assessment were assessed to determine the likelihood of their occurrence within the Survey Area, both prior to and post field survey. The assessment was completed based on the likelihood of occurrence criteria presented in Table 4.

Only species either recorded within the Survey Area or considered as having a high or medium likelihood of occurrence will be discussed in detail. Species classified as having a low likelihood of occurrence based on the above criteria will not be discussed unless a justification for this classification is required.

For fauna, taxa listed as Marine only under the EPBC Act were not included as conservation significant taxa because the Marine only listed taxa identified by the desktop assessment and field survey were common and widespread, taxa listed as Marine only do not constitute matters

of national environmental significance (MNES) under the EPBC Act, and the Survey Area does not contain any marine habitat.

Table 4 Likelihood of Occurrence Criteria

Rank	Criteria
Previously Recorded	The species has been previously recorded in the Survey Area
High (Likely to occur)	• Preferred habitat capable of supporting individuals or populations is present within the Survey Area • The survey Areas is within the taxon's known distribution • There are existing records of the species near the Survey Area (within 15 km) (flora) • There are existing records of the species near the Survey Area recorded within the last 15 years (fauna) • The species is strongly linked to a specific habitat, which is present in the Survey Area • The species has more general habitat preferences, and suitable habitat is present.
Medium (May occur)	• There is suitable (not necessarily preferred) habitat in the Survey Area, but the species is recorded infrequently in the locality • The Survey Area is within or near the taxon's known distribution • They Survey Area and surrounding area may support individuals or populations present within the Survey Area • There are existing records of the species from the locality (within 30 km for flora and 50 km for fauna), however: ○ The species is strongly linked to a specific habitat, of which only a small amount is present in the Survey Area ○ The species has more general habitat preferences, but only some suitable habitat is present.
Low (Unlikely to occur)	• No suitable habitat is present within the Survey Area, or the Survey Area is well outside the taxon's known distribution for the taxon is considered locally or regionally extinct • The Survey Area and surrounding habitat are unlikely to support individuals or populations of the taxon, however individuals may rarely occur as transients or vagrants • The species is linked to a specific habitat, which is absent from the Survey Area; or • Suitable habitat is present, however there are no existing records of the species from the locality despite reasonable previous search effort in suitable habitat; or • There is some suitable habitat in the Survey Area, however the species is very infrequently recorded in the locality.

3.2 Field Survey Effort

3.2.1 Trip 1

The biological survey was undertaken between the 11 - 15 October 2021.

The flora, vegetation and fauna survey was undertaken by Senior Botanist Jason Webb, Principal Zoologist Dr Michael Lohr and Ecologist Lachlan Crossley. The field team has over 20 years of combined experience conducting surveys of similar scope throughout Western Australia.

3.2.2 Trip 2

The biological survey was undertaken between the 15 - 19 November 2021.

The flora, vegetation and fauna survey was undertaken by Senior Botanist Jason Webb, Principal Ecologist Scott Walker and Ecologists Bridget Duncan and Lachlan Crossley. The field team has over 20 years of combined experience conducting surveys of similar scope throughout Western Australia.

The survey effort from both trips is shown in Figure 5.

3.3 Flora and Vegetation

3.3.1 Establishment of Flora Sites

Indicative flora sites were identified prior to the survey using aerial photography to estimate broad vegetation patterns within the Survey Area. The location and number of flora sites completed were adjusted on site to achieve sites most representative of the vegetation present.

Where possible, at least three flora sites were sampled for each vegetation type observed within the Survey Area. Some vegetation types that were not large enough to accommodate three flora sites had only one or two sites sampled.

Flora sites consisted of quadrats (20 m x 20 m) and relevés of approximately 400 m^2 where possible, or alternate configurations approximately equating to 400 m^2 (as required in areas such as drainage lines, gullies, and narrow ridge lines). A comprehensive record of the flora present at the time of sampling was recorded for both quadrat and relevé sites.

Flora site locations were recorded using a handheld GPS, the start and finish point of linear relevés, and the central point of circular relevés. At each flora site, the following was recorded:

- Site code
- Date and personnel
- Landform and soil description
- Relevant site descriptors including, slope, aspect, litter cover, bare ground cover and fire history
- Inventory of vascular flora including the approximate average height and percent foliar cover for each taxon recorded
- Vegetation description in accordance with the National Vegetation Information System (NVIS), Level 5 ‘association’, whereby the dominant growth form, height, cover, and species (three species) for the three traditional strata (upper, mid, and ground) are described are described

- Vegetation condition in accordance with the Southwest and Interzone Botanical Provinces/Eremaean and Northern Botanical Provinces vegetation condition scale (Environmental Protection Authority, 2016a), and evidence of disturbance (for example clearing, rubbish, feral animals, weed incursion and evidence of feral animals and dieback) where present, and
- Photograph of the vegetation occurring within the site.

A total of 74 quadrats, and 22 relevés were established within the Survey Area. An additional 91 mapping notes were completed to aid vegetation mapping delineation.

3.3.2 Opportunistic Flora

Additional flora taxa observed opportunistically around flora sites or while traversing on foot within the Survey Area were also recorded. Where populations of conservation significant flora taxa, Declared Pests (DPs) or WoNS were encountered, a GPS location and a count of the individuals present was recorded.

3.3.3 Targeted Searching

Prior to the survey conservation significant flora with the likelihood or potential to occur within the Survey Area was compiled (see section 3.1.3). Field personnel familiarised themselves with photographs, reference samples and descriptions of these taxa before conducting the survey.

The entire Survey Area was not systematically searched. Rather, targeted searching focussed on habitat suitable for Conservation Significant Flora. Furthermore, potential habitat within the proposed footprint was prioritised for targeted searching over areas outside the proposed footprint.

Personnel also actively searched for conservation significant flora species in and around flora sites, while traversing on foot within the Survey Area and in known locations or preferred habitat encountered in the Survey Area.

Where Threatened or Priority flora were encountered in the field a GPS location was taken and a count of individuals was recorded, followed by a search in the local vicinity to determine if any other individuals were present nearby and delineate population boundaries where relevant. Specimens of any potential conservation significant flora that could not be identified in the field were collected for identification and lodgement at the Western Australian Herbarium (WAH).

3.3.4 Statistical Analyses

Statistical analysis of quadrat data was undertaken in accordance with EPA guidelines for a detailed flora and vegetation survey.

3.3.4.1 Species Accumulation Curve

Species accumulation curves were plotted using Primer-E version 6.1.5. to determine the adequacy of the survey (Clarke and Gorley, 2006). The treatments comprised Sobs (Mao Tao), to reflect the number of species observed (based on a given total of species recorded), and richness estimators Chao 1, Chao 2, Jacknife 1, Bootstrap and Michaelis-Menton to estimate the total sample size of flora taxa present. Species accumulation curves for this survey were calculated using data collected from the flora sites within the Survey Area. All flora taxa, both annual and perennial, within each flora site were used in generating the species accumulation curve. Unconfirmed flora were included if they were the only species present from a Genus.

3.3.5 Taxonomy and Nomenclature

Where field identification of plant taxa was not possible, specimens were collected for identification using resources of the WAH. Identification of flora collections was completed by experienced Taxonomist Frank Obbens.

The finalised species list was cross-referenced against current flora databases and relevant taxonomic literature (Western Australian Herbarium, 2021) to determine name currency, conservation status and known distribution of each taxon. Introduced species were compared against the current BAM Act Declared Plants list the WoNS list to determine their control status (Department of Agriculture Water and the Environment, 2021b; Department of Primary Industries and Regional Development, 2021).

Any conservation significant flora taxa, including potential Threatened and Priority species, range extensions and potential new taxa were submitted to the WAH for verification and lodgement. Where relevant, Threatened and Priority Flora Report Forms (TPFRFs) were submitted to DBCA.

3.3.6 Vegetation Unit and Condition Mapping

Broad vegetation and condition mapping was conducted in the field, with boundaries delineated over aerial photography, at a scale of 1:5,000. Broad vegetation units were refined based on taxonomic identification of flora collections, statistical analysis of data collected from the quadrats and relevés, and mapping notes taken during the field survey. Vegetation condition mapping was refined based on site data and mapping notes. Finalised polygons were digitised and produced as electronic mapping data using GIS software.

3.4 Vertebrate Fauna

3.4.1 Vertebrate Fauna Habitat Assessment

Fauna habitat assessments were undertaken throughout the Survey Area to identify fauna habitat values. Habitat assessment locations are displayed in Figure 5. The following information, which has been adapted from the habitat attributes listed in the Technical Guidance (Environmental Protection Authority, 2020), was collected at each habitat assessment site using Fulcrum, a mobile data collection app:

- Site photo
- Landform
- Soil type and colour
- Rock types, surface stone cover and size classes
- Key habitat and microhabitat features including leaf litter, logs, burrows, rocky outcrops, rock crevices, hollows, water sources
- Habitat quality, fire history and evidence of disturbance
- General description of vegetation structure.

Fauna habitat mapping boundaries were delineated over aerial imagery at a scale of approximately 1:5,000 based on field observations and fauna habitat assessment data. Polygons were digitised and produced as electronic mapping data using GIS software.

3.4.2 Opportunistic Fauna Records and Active Searches

Opportunistic observations of fauna were recorded throughout the Survey Area. Observations of primary evidence (direct sightings, calls) and secondary evidence (tracks, scats, diggings etc.) were recorded. Active searches were undertaken throughout the Survey Area in microhabitats likely to contain fauna. They primarily involved raking leaf litter, peeling bark, and splitting dead wood.

3.4.3 Identification and Taxonomy

Where there was doubt on a species name (through subsequent name changes or taxonomic reviews), an effort was made to determine the current scientific name for each taxon. Taxonomy and nomenclature in this report follows the WA Museum checklist 2021 (Western Australian Museum, 2021) where relevant.

4 Results

4.1 Limitations

Limitations and constraints of the flora, vegetation and fauna survey are detailed below in Table 5

Table 5: Limitations and Constraints Associated with the Survey

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
Survey Scope	Not a constraint	The detailed flora and vegetation survey was undertaken in accordance with EPA Technical Guidance (Environmental Protection Authority, 2016) and was considered appropriate to support approvals applications. Targeted searching for flora of conservation significance was undertaken, however, systematic searches were not feasible. Rather, targeted searching focused on habitat suitable for conservation listed flora within the proposed development footprint. A basic terrestrial vertebrate fauna survey was undertaken in accordance with EPA Technical Guidance (Environmental Protection Authority, 2020) and was considered appropriate to support approvals applications.
Availability of Data	Not a constraint	All data required to complete the scope of works including regional and local contextual information was available.
Site Access	Not a constraint	The Survey Area was able to be accessed by vehicle and on foot.
Survey Intensity and Resources	Not a constraint	A total of 96 flora sites (comprising 74 quadrats and 22 relevés) were sampled across the Survey Area. An additional 91 mapping notes were undertaken to aid vegetation mapping and delineation. Sufficient time was allocated to the flora and vegetation survey, given the size and complexity of the Survey Area, and the expected level of survey intensity. The survey effort was considered adequate to assess the flora and vegetation values of the Survey Area and provide information required to support approvals applications. Eighty fauna habitat assessments were completed, and 61 fauna taxa were recorded opportunistically throughout the Survey Area. The survey effort was appropriate for a basic terrestrial vertebrate fauna survey.

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
Experience	Not a constraint	The flora and vegetation surveys were undertaken by Senior Botanist Jason Webb and Botanist Bridget Duncan, who have over 5 years combined experience conducting surveys of similar scope throughout Western Australia. Identification of flora collections was completed by experienced taxonomist Frank Obbens at the WAH. Any specimens with novel characteristics were submitted to the WAH for formal identification. The fauna survey was undertaken by Lachlan Crossley (Ecologist), Dr. Michael Lohr (Principal Zoologist) and Scott Walker (Principal Ecologist), who have 25 years of combined experience conducting fauna surveys. Fauna identification was reviewed by Dr. Michael Lohr (Principal Zoologist) and Evan Webb (Senior Zoologist), using photos of tracks and scats taken during the field survey.
Timing, weather, season	Not a constraint Partial limitation for fauna (Amphibians)	The recommended primary survey period for the region as per the EPA Technical Guidance, is September to November. Survey was conducted in October and November 2021. Rainfall was sufficient prior to the commencement of the field survey and air temperatures were slightly below average. Therefore, weather conditions were not a constraint. According to the EPA Technical Guidance, mammals do not have a preferred time of year for optimal observation. For reptiles, the guidance suggests October to December (for primary survey). As the surveys were conducted in October and November, timing was suitable for reptiles. The optimum timing for observation of amphibians is between May and August (autumn-winter breeders) and November-December (summer breeders). Therefore, the timing of the surveys was not suitable for autumn-winter breeders. The optimum time to observe birds is between September and December for most bush birds and between November and March for migratory birds. As the surveys were conducted in October and November, timing was suitable for birds.
Life Forms Sampled	Not a constraint	The Survey Area was traversed by vehicle and on foot and representative sites of all remnant vegetation were sampled. All flora species encountered within the Survey Area were recorded. A total of 145 vascular flora taxa were recorded from the Survey Area, comprising 93.8% native flora taxa and 6.2% introduced flora taxa. Of the 145 flora taxa recorded, 18 taxa (12.4%), could not be identified to species level because they were sterile at

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
		the time of the survey. This was not considered a constraint as it represented a very small portion of the flora sampled. None of the unknown flora taxa collected were analogous to Threatened or Priority flora taxa identified by the database searches as likely to occur within the Survey Area, nor were they representative of flora of other significance. The basic vertebrate fauna survey used a range of techniques to detect fauna taxa within the Survey Area. A total of 61 vertebrate fauna taxa were recorded within the Survey Area, comprising 54 confirmed native taxa and seven introduced taxa. All fauna taxa recorded were able to be identified to species level by direct or indirect observation with a high level of confidence.
Mapping Reliability	Not a constraint	Vegetation types were described and mapped based on quadrat/relevé data and additional mapping notes taken during the field survey. The number of sites and coverage of the Survey Area was considered sufficient to inform the survey. Fauna habitat mapping was based largely on vegetation mapping and there were no constraints on mapping reliability.
Disturbances (fire, flood etc.)	Not a constraint	No disturbances occurred during any of the surveys. Areas of disturbance associated with clearing, mining, rubbish, weeds, and the presence of introduced fauna were recorded but were not a constraint on the results of the survey.
Completeness	Not a constraint	The survey was considered complete for a detailed flora and vegetation survey and basic vertebrate fauna survey. All vegetation types and fauna habitats were surveyed and delineated within the Survey Area, however not all vegetation types were surveyed with three flora sites; five vegetation types were surveyed with one or two flora sites.

4.2 Flora and Vegetation

4.2.1 Literature Review

The key findings of the flora and vegetation reports reviewed are summarised in Appendix A1.

4.2.2 Database Searches

Database searches identified 90 conservation significant flora species occurring within 50 km of the Survey Area (Figure 6, Appendix B), comprising:

- Three Threatened taxa
- Twenty-seven Priority 1 taxa

- Fourteen Priority 2 taxa
- Forty Priority 3 taxa, and
- Six Priority 4 taxa.

4.2.3 Likelihood of Occurrence

The pre-survey likelihood of occurrence assessment identified that of the 90 conservation significant flora species identified by the desktop assessment:

- 20 were considered to have a high likelihood of occurrence
- 18 were considered to have a medium likelihood of occurrence
- 51 were considered to have a low likelihood of occurrence.

Following the survey, the likelihood of occurrence was re-assessed and found:

- Two taxa were considered to have a high likelihood of occurrence, due to close records and existing, contiguous habitat within the Survey Area.

The likelihood of occurrence assessment is provided in Appendix C.

4.2.4 Vegetation of Conservation Significance

Database searches did not return any listed Threatened Ecological Communities or Protected Ecological Communities within 50 km of the Survey Area.

4.2.5 Flora Composition

The survey recorded a total of 149 taxa from 78 genera across 35 families (Appendix D). The dominant families were Chenopodiaceae (26 taxa) and Myrtaceae (15 taxa). The most dominant genera were *Eucalyptus* (12 taxa) and *Eremophila* (10 taxa).

4.2.6 Flora of Conservation Significance

4.2.6.1 Threatened or Priority Flora

No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened pursuant to the BC Act 2016 were recorded during the survey.

One Priority taxon was recorded within the Survey Area (Figure 7a, Plate 1). A population consisting of approximately 10 individuals of *Austrostipa blackii* (P3) was recorded in quadrat C1Q01. This taxon is a tufted, perennial, grass, typically growing up to 1 m high that flowers between September and November. The WAH has 41 specimens lodged with records across the Avon Wheatbelt, Coolgardie and Yalgoo bioregions (Western Australian Herbarium, 2022). The habitat descriptions for this taxon are typically mixed Eucalypt species, tall Acacia shrublands and open woodlands of *Allocasuarina dielsiana* and *Allocasuarina tessellata* (Western Australian Herbarium, 2022). *Austrostipa blackii* (P3) grows on gently inclined lower slopes of basalt with red-brown deep sandy clay loam soils (Western Australian Herbarium, 2022).

Plate 1: *Austrostipa blackii* (P3)

Within the Survey Area it was recorded within vegetation unit AcEoaDl (quadrat C1Q01), in association with *Acacia collegialis, Eremophila* spp. and *Dodonaea lobulata*. This vegetation type was sampled heavily and was not recorded at any other site.

4.2.7 Introduced Taxa

A total of 13 introduced taxa were recorded within the Survey Area, representing 8.7% of the total taxa recorded (Table 6). One taxon (**Opuntia stricta*) is a Declared Pest and listed as a WoNS (DAWE, 2021b; DPIRD, 2021). Eight individuals of **O. stricta* were recorded (Figure 8).

Three introduced taxa are unlisted under the BAM Act, which prohibits them access to Western Australia, however they are not assigned a control management category (DPIRD, 2021).

Table 6: Introduced Flora Species within the Survey Area

Species	Common Name	Status under BAM Act	WoNS
**Agave americana*	Century plant	Permitted - s11	No
**Asphodelus fistulosus*	Onion Weed	Permitted - s11	No
**Carrichtera annua*	Ward's Weed	Permitted - s11	No
**Centaurea melitensis*	Maltese Cockspur	Permitted - s11	No
**Crassula ovata*	Jade Tree	Permitted - s11	No

Species	Common Name	Status under BAM Act	WoNS
**Heliotropium europaeum*	Common Heliotrope	Permitted - s11	No
**Nicotiana glauca*	Tree Tobacco	Permitted - s11	No
**Oligocarpus calendulaceus*	-	Unlisted – s14	No
**Rumex vesicaria*	Ruby Dock	Unlisted – s14	No
**Salvia verbenaca*	Wild Sage	Permitted - s11	No
**Schinus molle* var. *areira*	-	Unlisted – s14	No
**Sonchus asper*	Rough Sowthistle	Permitted - s11	No
**Opuntia stricta*	Common Prickly Pear	Declared Pest - s22(2)	Yes

4.2.8 Unconfirmed Flora

Eighteen specimens (12.1% of the taxa recorded) could not be identified to species level because the taxa were sterile at the time of the survey (Appendix D). Of these, all but one, Malvaceae sp., were able to be identified to genus level, and two were assigned a tentative genus, ?*Enchylaena tomentosa* and ?*Pimelea* sp.

None of the unconfirmed flora taxa were analogous to Priority flora taxa identified by the database searches.

4.2.9 Vegetation Condition

The Survey Area has been subjected to medium to high level disturbances, including historical small and large scale mine excavations, makeshift tracks, cattle grazing, weeds, and litter. As such, vegetation condition with the Survey Area was predominantly Excellent, and ranged to Completely Degraded (where all vegetation had been completely cleared) (Keighery, 1994) (Table 7, Figure 7).

Table 7 Area (ha) covered by each vegetation condition category within the Survey Area

Vegetation Condition	Area (ha)	% of Survey Area
Excellent	790.6	58.1%
Very Good	327.9	21.2%
Good	78.4	5.8%
Completely Degraded	163.6	12%
Total	**1360.7**	**100**

4.2.10 Vegetation Types

Ten vegetation types were described and mapped across four broad landforms within the Survey Area (plains, rocky hills, claypan, and lake) (Table 8, Figure 8). The majority of the Survey Area was dominated by open plains with a mosaic of low *Eucalyptus* spp. (34.8%) which grew together across the plains, and Salmon Gum (*Eucalyptus salmonophloia*) open woodlands (31.4%). Small rocky hills dominated by *Acacia collegialis* shrubland also covered 13.1% of the Survey Area. While 11.5% of the Survey Area was considered to be 'Cleared', some of this was showing signs of revegetation with both native species (such as *Atriplex* and *Maireana*) and introduced (weed) species. These areas did not appear to have been intentionally revegetated.

Detailed data sheets for each flora site are provided in Appendix E.

Table 8: Vegetation Types Occurring within the Survey Area

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Photograph
AcEoaDl *Acacia collegialis* (*A. acuminata*) tall shrubland over *Eremophila oldfieldii* subsp. *angustifolia*, *E. georgei*, *A. tetragonophylla* (*Senna artemisioides* subsp. *filifolia*, *Exocarpos aphyllus*) mid shrubland over *Dodonaea lobulata* (*Atriplex vesicaria, Ptilotus obovatus* var. *obovatus*) low shrubland	Rocky hills	178.5 ha 13.1%	C1Q01, C1Q04, C1Q06, C1Q09, C1Q21, C1Q25, C1Q26, C1Q28, C1Q29, C1Q30, C1R04, C2Q07, C2Q09, C2Q14, C2Q18, C2Q32, C2Q33, C2Q34, C2Q35, C2Q38, C2Q40	
Ec *Eucalyptus celastroides* low woodland	Low slopes of rocky hills	7.4 ha 0.5%	C2Q43, C2R17	

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Photograph
EgAhSaf *Eucalyptus griffithsii* low open woodland over *Acacia hemiteles* and *Dodonaea stenozyga* (*A. jennerae, Alyxia buxifolia*) mid shrubland over *Senna artemisioides* subsp. *filifola* and *Atriplex vesicaria* (*Olearia muelleri*) low open shrubland	Plains	75.6 ha 5.6%	C1Q10, C1Q20, C1R13, C2Q27, C2Q29, C2Q31, C2Q41, C2Q50, C3Q01, C3Q02A, C3R01	
EooEiiDs *Eucalyptus oleosa* subsp. *oleosa* low open woodland over *Eremophila interstans* subsp. *interstans* mid isolated shrubs over *Dodonaea* stenozyga, *Eremophila glabra* subsp. *glabra*, and *Olearia muelleri* low open shrubland	Plains	11.1 ha 0.8%	C2Q11, C2Q37	

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Photograph
ErMhOm *Eucalyptus* ?*ravida* low open woodland over *Melaleuca* ?*hamata* (*M. pauperiflora* subsp. *fastigiata*, *Eremophila oppositifolia* subsp. *angustifolia*) tall open shrubland over *Olearia muelleri* low isolated shrubs	Plains	4.7 ha 0.3%	C2Q02, C2Q04, C2Q06	
EsEiiAv *Eucalyptus salmonophloia* mid open woodland over *Eremophila intertans* subsp. *interstans* (*Eremophila parvifolia* subsp. *auricampi*, *Senna artemisioides* subsp. *filifola*) tall to mid isolated shrubs over Atriplex vesicaria low open shrubland	Plains	428.0 ha 31.4%	C1Q03, C1Q22, C1Q23, C1Q24, C2Q12, C2Q19, C2Q20, C2Q21, C2Q24, C2Q26, C2Q28, C2Q46, C2Q52, C2Q54	

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Photograph
EsppEiiSaa *Eucalyptus salmonophloia* mid isolated trees over a mosaic of *E. celastroides, E. clelandiorum*, and *E. torquata* low open woodland over *Eremophila interstans* subsp. *interstans* (*Eremophila parvifolia* subsp. *auricampi*) mid isolated shrubs over *Senna artemisioides* subsp. *artemisioides*, *S. artemisioides* subsp. *filifola*, and *Atriplex vesicaria* low open shrubland	Plains, low hills	472.3 ha 34.8%	C1Q02, C1Q05, C1R05, C1R09, C1R10, C2Q01, C2Q03, C2Q05, C2Q08, C2Q10, C2Q13, C2Q15, C2Q16, C2Q36, C2Q39, C2Q42, C2Q45, C2R09, C3Q02, C3Q02B, C3Q06	
EtEaEpa *Eucalyptus torquata* low open woodland over *Exocarpos* aphyllus mid isolated shrubs over *Eremophila parvifolia* subsp. *auricampi*, *Westringia rigida*, and *Scaevola spinescens* (*Olearia muelleri*) low open shrubland	Plains, lower slopes of rocky hills	20.7 ha 1.5%	C1Q07, C1Q08, C1Q27, C1R01, C1R02, C1R03, C1R11	

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Photograph
SI *Streptoglossa liatroides* low open herbland	Clay	0.3 ha <0.1%	C2R44	
Lake Coolgardie Gorge, natural semi-permanent pool system, with a fringe of native and introduced flora taxa including *Eucalyptus spp.*, **Schinus molle* var. *areira*, **Helioptropium europaeum*, and **Sonchus asper.*	Lake system	5.6 ha 0.4%	C2R07	

Vegetation Unit and Description*	Local Landform	Total Area, Proportion of the Survey Area	Sites	Photograph
Cleared Cleared or historically cleared areas including mine pits and borrow pits (often filled with water), bitumen roads, and dirt tracks. Some of these areas were showing signs of revegetation. With occasional *Eucalyptus griffithsii, Atriplex vesicaria*, *Maireana* spp., and assorted weed species.	Plains	156.9 ha 11.5%	C2Q17, C2Q25	

*Brackets indicate species that may or may not be present, but were observed as dominant/sub-dominant at some of the sites that make up the vegetation type

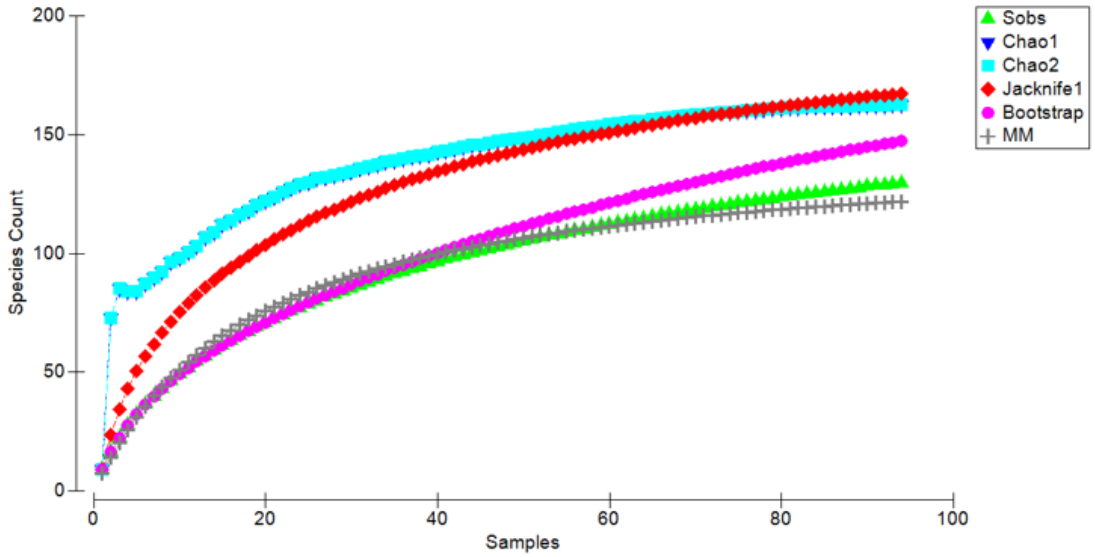
4.2.11 Groundwater Dependent Ecosystems

The Groundwater Depended Ecosystem (GDE) Atlas identified the Survey Area did not contain any GDEs (Bureau of Meteorology, 2022). The results from the flora and vegetation survey support the GDE Atlas as vegetation in the Survey Area comprised xerophytic species that are not groundwater dependent.

4.2.12 Survey Adequacy

Ninety-six flora sites (74 quadrats and 22 relevés) were sampled across the Survey Area. This was adequate to ensure sufficient coverage given the overall size of the Survey Area. Two vegetation types were sampled with only two sites, while a further two were sampled with a single site. This was due to the vegetation being highly restricted in the Survey Area.

The sample rarefaction (Mao Tau) for the Survey Area produced a smooth S_{obs} curve, steadily increasing towards asymptote indicating that the survey captured the majority of flora taxa present with the Survey Area (Graph 2).



Graph 2: Flora Species Accumulation Curve (Sample rarefaction)

Estimated species richness for the Survey Area ranged from 122.1 to 167.6, with an observed value of 130 taxa (Table 9). Richness estimators indicated that the survey was approximately 77.5% to 106.4% adequate in recording the full complement of vascular flora taxa within the Survey Area (Table 9).

The data used to produce the species accumulation curve was conservative because opportunistic species (which are not associated with a site) were not included. Unconfirmed flora taxa were included if they were the only species present from a Genus.

Table 9: Species Richness Indicators

Treatment	Expected Species Richness	Percentage Adequate
Chao 1	162.8	79.8
Chao 2	162.8	79.8
Jacknife 1	167.6	77.5
Bootstrap	147.6	88.0
Michaelis-Menton	122.14	106.4

4.3 Vertebrate Fauna

4.3.1 Desktop Assessment

The desktop assessment identified 20 conservation significant terrestrial vertebrate fauna species potentially occurring within the Survey Area, comprising 17 birds and three mammals.

Key findings of the literature review are summarized in Appendix A2. Database search results are presented in Figure 9 and Appendix B.

4.3.2 Fauna Habitat

Five broad fauna habitats were identified and mapped within the Survey Area (Figure 10). Habitat condition varied throughout the Survey Area with the most prolific forms of disturbance being previous mining activity, litter, and vehicle tracks. Other disturbances included clearing, erosion, weeds, and introduced fauna.

A description, extent within the Survey Area, and a representative photo is provided for each fauna habitat in Table 10. Small discrepancies in fauna habitat extents (i.e., not adding up to the exact area extent of the Survey Area) are due to rounding. Fauna habitat mapping is presented in Figure 10 and site sheets for each habitat assessment are shown in Appendix F.

Table 10: Fauna Habitat Types within the Survey Area

Fauna Habitat	Total Area, Proportion of the Survey Area	Habitat Description	Representative Photo
Acacia Shrublands	75.8 ha	*Eucalyptus griffithsii* low open woodland over *Acacia hemiteles* and *Dodonaea stenozyga (A. jennerae, Alyxia buxifolia)* mid shrubland over *Senna artemisioides* subsp. *filifola* and *Atriplex vesicaria (Olearia muelleri)* low open shrubland Hollow logs, leaf litter, and peeling bark are present throughout this habitat type. These microhabitat features provide shelter and foraging opportunities for small reptiles, birds, and mammals. Conservation significant fauna such as the Malleefowl (*Leipoa ocellata*) and the Western Quoll, Chuditch (*Dasyurus geoffroii fortis*) may use this habitat. Habitat condition varied from disturbed to very good. Evidence of disturbance includes previous mining activity, vehicle tracks, litter, and the presence of introduced fauna.	

Fauna Habitat	Total Area, Proportion of the Survey Area	Habitat Description	Representative Photo
Eucalyptus Woodlands	943.9 ha	Mixed *Eucalyptus* sp. woodlands over *Acacia* sp., *Dodonaea* sp., *Eremophila* sp. or *Melaleuca* sp., mixed shrublands. Peeling bark, woody debris, leaf litter and hollow logs were observed throughout this habitat type. These microhabitat features provide shelter for small reptiles and mammals. The canopy of trees provides shelter and foraging habitat for birds. Evidence of the conservation significant Western Quoll, Chuditch (*Dasyurus geoffroii fortis*) was recorded in this habitat type. The Malleefowl (*Leipoa ocellata*) may also use this habitat. Habitat condition varied from highly degraded to high quality. Evidence of disturbance includes previous mining activity, vehicle tracks, litter, and the presence of introduced fauna.	

Fauna Habitat	Total Area, Proportion of the Survey Area	Habitat Description	Representative Photo
Open Water	2.7 ha	Coolgardie Gorge was located within the Survey Area, with a fringe of introduced flora taxa including **Schinus molle* var. *areira*, **Helioptropium europaeum*, and **Sonchus asper.* Additional standing water was identified within remnant mine pits, however this may only be temporary. Microhabitats and habitat features unique to this habitat type include exfoliating rock, steep rocky crevices and water sources. Migratory birds such as the Common Sandpiper (*Actitis hypoleucos*), Sharp-tailed Sandpiper (*Calidris acuminata*), Curlew Sandpiper (*Calidris ferruginea*), Wood Sandpiper (*Tringa glareola*), Common Greenshank (*Tringa nebularia*) and Glossy Ibis (*Plegadis falcinellus*) may use these areas. Habitat condition varies from highly degraded to disturbed. Evidence of disturbance includes previous mining activity, vehicle tracks, litter, and the presence of introduced fauna.	

Fauna Habitat	Total Area, Proportion of the Survey Area	Habitat Description	Representative Photo
Rocky Slopes	178.5	*Acacia collegialis* (*A. acuminata*) tall shrubland over *Eremophila oldfieldii* subsp. *angustifolia*, *E. georgei*, *Acacia tetragonophylla* (*Senna artemisioides* subsp. *filifolia*, *Exocarpos* aphyllus) mid shrubland over *Dodonaea lobulata* (*Atriplex vesicaria, Ptilotus obovatus* var. *obovatus*) low shrubland Leaf litter, peeling bark, rock crevices, and woody debris provides shelter for small reptiles and mammals. Shrublands provide shelter and foraging habitat for birds, reptiles, and mammals. Malleefowl (*Leipoa ocellata*) may forage within this habitat, however, it is unlikely to nest in this habitat due to the rocky substrate. The Western Quoll, Chuditch (*Dasyurus geoffroii fortis*) may use this habitat. Habitat condition varies from disturbed to very good. Evidence of disturbance includes previous mining activities, vehicle tracks, litter, and the presence of introduced fauna.	

Fauna Habitat	Total Area, Proportion of the Survey Area	Habitat Description	Representative Photo
Cleared Areas	160.9 ha	Cleared or historically cleared areas including mine pits and borrow pits (often filled with water), bitumen roads, and dirt tracks. Areas of completely cleared land include vehicle access tracks and previous mining activity including mining pits. These areas have limited value as habitat for fauna. The mining pits may provide some habitat for small reptiles and mammals in the form of steep rocky crevices and isolated shrubs and grasses. Evidence of disturbance includes previous mining activity, vehicle tracks, litter, and the presence of introduced fauna.	

4.3.3 Fauna Records

The terrestrial vertebrate fauna survey recorded a total of 61 fauna taxa from 33 families. An inventory of fauna recorded during the field survey is provided in Appendix G.

Table 11: Overview of Vertebrate Fauna Species Recorded

Fauna group	Number of species	Number of families
Birds	42	21
Mammals	10	7
Reptiles	9	5
Amphibians	0	0
Total	**61**	**33**

4.3.3.1 Birds

A total of 42 avian taxa from 21 families were recorded throughout the Survey Area. The most recorded taxon was the Budgerigar (*Melopsittacus undulatus*), followed by the Australian Ringneck (*Platycercus zonarius*) and the Singing Honeyeater (*Gavicalis virescens*). The most diverse avifauna families were Meliphagidae (seven taxa) and Acanthizidae (six taxa).

4.3.3.2 Mammals

A total of three native mammals were recorded within the Survey Area. The most recorded native mammal taxon was the Western Grey Kangaroo (*Macropus fuliginosus melanops*). Seven introduced mammal taxa were recorded in the Survey Area, Goat (*Capra hircus*), European Cattle (*Bos primigenius taurus*), Dog/Dingo (*Canis familiaris*), Red fox (*Vulpes vulpes*), Horse (*Equus caballus*), Cat (*Felis catus*) and Rabbit (*Oryctolagus cuniculus*).

4.3.3.3 Reptiles

A total of nine reptilian species from five families were recorded throughout the Survey Area. The most recorded species was the Bobtail (*Tiliqua rugosa*) followed by the Bynoe's Gecko (*Heteronotia binoei*). The most diverse reptilian family was Agamidae (four taxa).

4.3.3.4 Amphibians

No amphibians were recorded during the field survey.

4.3.4 Conservation Significant Fauna

One conservation significant taxon was recorded via observation of a scat during the fauna survey, the Western Quoll, Chuditch (*Dasyurus geoffroii fortis*), which is listed Vulnerable under the BC and EPBC Act (Plate 2).

Plate 2: Scat of Western Quoll, Chuditch (*Dasyurus geoffroii fortis*)

GPS Coordinates: Latitude: -30.920324, Longitude: 121.184610. Image Source 360 Environmental.

Three conservation significant fauna taxa were assessed as having a high likelihood of occurrence within the Survey Area:

- Malleefowl (*Leipoa ocellata*), Vulnerable under the BC and EPBC Act
- Common Sandpiper (*Actitis hypoleucos*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act
- Common Greenshank (*Tringa nebularia*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act.

Four conservation significant taxa were assessed as having a medium likelihood of occurrence within the Survey Area:

- Sharp-tailed Sandpiper (*Calidris acuminata*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act
- Curlew Sandpiper (*Calidris ferruginea*), Critically Endangered, International Agreement under the BC Act and Critically Endangered, Migratory and Marine under the EPBC Act

- Wood Sandpiper (*Tringa glareola*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act
- Glossy Ibis (*Plegadis falcinellus*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act.

Twelve conservation significant taxa were assessed as having a low likelihood of occurrence within the Survey Area. Further details regarding recorded and potential conservation significant fauna are provided below in Table 12.

Table 12: Conservation Significant Fauna Likelihood of Occurrence

Conservation Status: State - Listed under Biodiversity Conservation Act 2016 or Department of Biodiversity, Conservation and Attractions Conservation List, Federal - Listed under Environmental Protection and Biodiversity Conservation Act 1999. CR - Critically Endangered, EN - Endangered, VU - Vulnerable, IA/MI - Migratory, CD - Conservation Dependent fauna, OS - Other Specially Protected fauna, MA - Marine, P - Listed as Priority by DBCA.

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
AVIAN											
Apodidae	*Apus pacificus*	Pacific Swift (Fork-tailed Swift)	IA	MI, MA		x				Low	Three records within 100 km on the Survey Area (Atlas of Living Australia, 2022a). Species may fly over the Survey Area as it covers a wide range of airspace over varied habitat (Morcombe, 2003).
Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's Cockatoo	EN	EN	x		x	4		Low	This species was recorded 30 km NE of the Survey Area in Kalgoorlie (Department of Biodiversity Conservation and Attractions, 2021c). However, these records occur well outside the known distribution of the species and likely represent a vagrant occurrence of the taxon (Department of Sustainability

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
											Environment Water Population and Communities, 2012).
Charadriidae	*Thinornis cucullatus*	Hooded Plover (Hooded Dotterel)	P4	MA			x			Low	Closest record 42 km NE of the Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). No suitable habitat within the Survey Area (Menkhorst *et al.*, 2017).
Falconidae	*Falco hypoleucos*	Grey Falcon	VU	VU		x				Low	No recent nearby records. Some records within 100 km on the Survey Area (Atlas of Living Australia, 2022b). Preferred nesting habitat absent. May use Survey Area for hunting (Menkhorst *et al.*, 2017).
Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU	x	x	x	79		High	Recent records within 1 km of the Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). Recorded 40 km north of the Survey Area in 2019 (Phoenix

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
											Environmental Sciences, 2019). Suitable habitat present, unburned mallee and woodland with abundant litter and low scrub (Morcombe, 2003)
Motacillidae	*Motacilla cinerea*	Grey Wagtail	IA	MI, MA		x				Low	Survey Area is well outside of the distribution of this species Area (Atlas of Living Australia, 2022b). Some suitable habitat present in parts i.e. water bodies (Morcombe, 2003).
Psittaculidae	*Pezoporus occidentalis*	Night Parrot	CR	EN		x				Low	No records within 100 km on the Survey Area (Atlas of Living Australia, 2022b). No suitable habitat within the Survey Area (Morcombe, 2003).
Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	IA	MI, MA	x	x	x	3		Previously Recorded	Three recent records within the Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). Some suitable habitat present i.e. interior wetlands – narrow muddy edges of billabongs (Morcombe, 2003).

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
Scolopacidae	*Calidris acuminata*	Sharp-tailed Sandpiper	IA	MI, MA	x	x	x	2		Medium	Nearest record 15 km NW of the Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). Suitable habitat present (water bodies) (Morcombe, 2003).
Scolopacidae	*Calidris alba*	Sanderling	IA	MI, MA	x		x	1		Low	Nearest record in Kalgoorlie (Department of Biodiversity Conservation and Attractions, 2021c). No suitable habitat within the Survey Area (Menkhorst et al., 2017).
Scolopacidae	*Calidris ferruginea*	Curlew Sandpiper	CR, IA	CR, MI, MA	x	x	x	1		Medium	Nearest record 15 km NW of Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). Suitable habitat within the Survey Area i.e. around lakes, dams (Morcombe, 2003).
Scolopacidae	*Calidris melanotos*	Pectoral Sandpiper	IA	MI, MA		x				Low	Survey Area is well outside of the distribution of this species Area (Atlas of Living Australia, 2022b). Some suitable habitat present in parts i.e. inland

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
											water bodies (Morcombe, 2003).
Scolopacidae	*Calidris ruficollis*	Red-necked Stint	IA	MI, MA	x		x	1		Low	Nearest record 15 km NW of Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). No suitable habitat within the Survey Area i.e., mudflats (Morcombe, 2003).
Scolopacidae	*Tringa brevipes*	Grey-tailed Tattler	IA, P4	MI, MA	x		x	1		Low	Nearest record 20 km NE of Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). No suitable habitat within the Survey Area, coastal in Australia (Menkhorst et al., 2017).
Scolopacidae	*Tringa glareola*	Wood Sandpiper	IA	MI, MA	x		x			Medium	Nearest record 30 km NE of the Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). Suitable habitat within the Survey Area i.e., freshwater

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
											wetlands (Menkhorst et al., 2017).
Scolopacidae	*Tringa nebularia*	Common Greenshank	IA	MI, MA	x	x	x	2		Previously Recorded	Recent record within the Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). Suitable habitat within the survey areas i.e. temporary inland wetlands (Morcombe, 2003).
Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis	IA	MI, MA			x			Medium	Only record 27 km NE of the Survey Area in Kalgoorlie (Department of Biodiversity Conservation and Attractions, 2021c). Some suitable habitat present i.e. temporary wetlands (Morcombe, 2003).
MAMMALIAN											
Dasyuridae	*Dasyurus geoffroii fortis*	Western Quoll, Chuditch	VU	VU		x	x		x	**Recorded**	A scat was found within the Survey Area during the current survey, identified to be this species. Some suitable habitat present mallee

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
											shrubland (Van Dyck and Strahan, 2008).
Myrmecobiidae	*Myrmecobius fasciatus*	Numbat, Walpurti	EN	EN	x					Low	No nearby records (Atlas of Living Australia, 2022b). Some suitable habitat is present i.e. eucalypts and wandoo woodland (Van Dyck and Strahan, 2008). The only natural populations exist well outside the Survey Area in the far north of WA (Department of Biodiversity Conservation and Attractions, 2017b).
Thylacomyidae	*Macrotis lagotis*	Bilby, Dalgyte	VU	VU	x					Low	No nearby records (Atlas of Living Australia, 2022b). No suitable habitat is present (Van Dyck and Strahan, 2008).
INSECTS											
Lycaenidae	*Jalmenus aridus*	Inland Hairstreak	P1 (not WAM)		x		x			Medium	Nearest record 19 km NE of the Survey Area (Department of Biodiversity Conservation and Attractions, 2021c). Suitable habitat present within the Survey Area

Family	Scientific Name	Common Name	Conservation Status		Source					Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA	DBCA 15 yrs	Field Survey		
											(Williams, Williams and Lundstrom, 1998)
Lycaenidae	*Ogyris subterrestris petrina*	Arid Bronze Azure Butterfly	CR (not WAM)	CR (not WAM)	x	x	x			Medium	No recent records (Department of Biodiversity Conservation and Attractions, 2021c). Suitable habitat present (smooth bark *Eucalyptus* sp.) (Department of Biodiversity Conservation and Attractions, 2020b).

5 Discussion

5.1 Flora and Vegetation

5.1.1 Flora Composition

The suite of flora taxa recorded during the survey is considered typical for the area (Beard 1976) and aligns with the database search results obtained and with previous surveys conducted around the Survey Area.

5.1.2 Survey Adequacy

The flora and vegetation survey effort was in accordance with the scope of works, and appropriate for a detailed flora and vegetation survey in the Eastern Goldfields region.

The Survey Area was sampled with 74 quadrats, 22 relevés and an additional 91 mapping notes. Of the 10 vegetation types defined, four were not sampled with three flora sites. Vegetation types Ec and EooEiiDs were sampled with two sites only due to limited distribution of the vegetation (<1% each). Vegetation types Sl, and Lake were sampled only once due to the landforms (clay and lake) being very limited in distribution.

The inventory of vascular flora was compiled using site data and opportunistic observations made while traversing between sites and during targeted searching within the Survey Area. The entire Survey Area was not systematically searched, and therefore additional flora taxa, and records of conservation significant flora and weed species may be recorded with additional survey effort.

5.1.3 Flora of Conservation Significance

No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened Flora pursuant to the BC Act 2016 were recorded within the Survey Area.

Ten individuals of *Austrostipa blackii* (P3) were recorded from quadrat C1Q01, within vegetation type AcEoaDl. This vegetation type was sampled heavily, and no other records of the taxon were recorded. With more intensive surveys additional individuals may be recorded, as this vegetation type and landform (rocky hills) cover 13.1% of the Survey Area.

5.1.4 Likelihood of Occurrence

Of the 90 Priority flora identified by the database searches, only one was recorded from the Survey Area (*Austrostipa blackii* (P3)). Of the remaining 89 taxa, two were considered to retain a high likelihood of occurrence following the survey:

- *Acacia websteri* (P1): A tall shrub or tree is known only from the Bencubbin and Coolgardie-Kambalda areas, and grows mostly in red loam, sand, and clay in drainage depressions among shrubland and scrub. The habitat for this taxon is present within the Survey Area, and the closest location is <1 km from the survey boundary.

- *Eremophila veronica* (P3): A record of this erect shrub to 40cm high (80cm wide) was located 500 m from the Survey Area, in vegetation similar in appearance to that within the survey boundary. The record was noted as growing with *E. salubris, A. burkittii*, and *Cylindropuntia tunicata*.

A further 18 taxa were considered to have a medium likelihood of occurrence due to presence of habitat and records within 15 km of the Survey Area boundary. The remaining taxa were considered to have a low likelihood of occurrence.

5.1.5 Introduced Flora

Thirteen weed species were recorded in the Survey Area, of which one, **Opuntia stricta* (Common Prickly Pear), is a Declared Pest and listed as a WoNS.

Weed diversity and population abundance are consistent with the region and land use (mining operations, broadacre cropping and sheep farming).

Weed species richness and abundance was greatest in previously cleared areas such as old drill pads/ excavation works and associated tracks. Weed species, particularly **Opuntia stricta* were present in relatively high abundance near Great Eastern Highway. The publicly accessible semi-pool 'Coolgardie Gorge' contained dense weed numbers along the edge and in the immediate surrounds.

5.1.6 Unconfirmed Flora

Eighteen specimens collected during the field survey were sterile and could not be confidently identified beyond genus level. None of these were analogous to Priority flora taxa identified by the database searches.

5.1.7 Vegetation Types

No vegetation representative of any TECs or PECs was recorded in the Survey Area.

Mapping reliability across the survey area was high, and the majority of the Survey Area was traversed on foot. The plains through the majority of the Survey Area showed a mosaic of different *Eucalyptus* spp. that could not be easily separated via quadrating or aerial imagery. However, *E. salmonophloia* was scattered across the majority of the plains, with *E. celastroides, E. clelandiorum*, and *E. torquate* at varying densities across the plains. This is common across the region, as underlying geology affects the vegetation on a fine scale. The Survey Area was dominated by these plains, along with rocky hills dominated by *Acacia collegialis* tall shrubs. While this vegetation type AcEoaDl rocky hills did support *Austropstipa blackii* (P3), only one population was recorded through 21 quadrats in the vegetation. As such it was not considered to be a distinctive habitat of the taxon, and not considered to be vegetation of local significance.

Coolgardie Gorge is a natural semi-pool landform present within the Survey Area, which is also a public recreation area, as such it contains many introduced (weed) taxa. The landform is limited in size, with the vegetation unique and restricted to a small radius around the semi-pool.

Numerous patches within the Survey Area were considered either recently or historically cleared. Some of these historically cleared areas contained some regrowing native and weed taxa, however, were still considered to be cleared as they were predominantly bare, and any native taxa did not represent the surrounding vegetation. One small area of claypan vegetation was recorded and sampled with a single quadrat. After recent rains, this claypan landform may contain an increased load of annual and cryptic taxa.

5.2 Vertebrate Fauna

5.2.1 Fauna Habitat

The five broad fauna habitats identified within the Survey Area are typical of the Coolgardie bioregion and consistent with habitats identified by previous studies in the region (Terrestrial Ecosystems, 2018; Phoenix Environmental Sciences, 2019; Strategen Environmental, 2019; Biostat Pty Ltd, 2020). Of the habitats within the Survey Area, the *Eucalyptus* Woodlands, *Acacia* Shrublands and Open Water habitats, particularly the semi-permanent pool at Coolgardie Gorge, represent the most value to the overall fauna assemblage within the Survey Area. The *Eucalyptus* Woodlands and the *Acacia* Shrubland habitats are valuable due to the variety of micro habitats present. Peeling bark, woody debris, leaf litter and hollow logs were observed throughout these habitat types. The dense understorey observed in these habitat types may provide refuge and shelter for a variety of mammals, reptiles, and birds. Specifically, these habitat types may provide suitable breeding and nesting habitat for the Malleefowl (*Leipoa ocellata*) and foraging habitat for the Western Quoll, Chuditch (*Dasyurus geoffroii fortis*).

The Open Water habitat provides an important water source for fauna within the Survey Area and is particularly important for water birds, including several significant species. The Open Water habitat at Coolgardie Gorge is surrounded by vegetation that provides potential foraging, roosting, and nesting habitat for a wide variety of fauna taxa. Old mine pits throughout the Survey Area may have water present, however it will be of less value to most fauna species due to a lack of surrounding vegetation.

The Rocky Slopes habitat contains crevices that may provide refuge and shelter for small fauna taxa. This habitat type generally lacks the dense understory found in the *Eucalyptus* Woodlands and the *Acacia* Shrubland habitats, making it less suitable for the Malleefowl and its slope reduces its value as Malleefowl nesting habitat.

Cleared Areas provide limited habitat value for fauna; however, some small mammals and reptiles may use the rocky crevices within the steep walls of mining pits and the low isolated shrubs occasionally found in other Cleared Areas for shelter and foraging.

The habitat condition varied widely throughout the Survey Area from highly degraded to high quality. The most common forms of disturbance included previous mining activity, litter, and vehicle tracks. Species with a limited dispersal capability may be restricted by these impacts, whilst movements of birds, larger reptiles, and mammals between surrounding habitats are unlikely to be severely impeded by these disturbances.

5.2.2 Conservation Significant Fauna

5.2.2.1 Recorded

Western Quoll, Chuditch (*Dasyurus geoffroii fortis*), Vulnerable under the BC Act and EPBC Act

The Chuditch inhabits areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland (Van Dyck and Strahan, 2008). The species is generally highly mobile and uses bush remnants as corridors (Woinarski, Burbidge and Harrison, 2014). The Chuditch is a largely nocturnal animal, feeding on a carnivorous diet of mammals, birds, lizards, and frogs. Although they have been recorded foraging during the day at particular times such as during the breeding season or when cold and wet weather restricts their nocturnal movements (Van Dyck and Strahan, 2008). Most diurnal nesting sites in sclerophyll forest consist of hollow logs or earth burrows, although bandicoot nests and hollow tree bases may be used (Van Dyck and Strahan, 2008). The Chuditch was abundant prior to European settlement, and it is now largely restricted to the south-west of Western Australia, with small numbers in the Midwest, Wheatbelt and South Coast regions (Department of Biodiversity Conservation and Attractions, 2017a).

Chuditch scat was recorded within the Survey Area. Of the habitat types present with the Survey Area the *Eucalyptus* Woodland and *Acacia* Shrubland present the most value to this species. These habitats contain mallee woodland and shrubland, which the Chuditch often inhabits as well hollow logs and tree bases which are used for denning (Van Dyck and Strahan, 2008). The suitability of these habits likely varies with the degree of disturbance which may alter prevalence of both denning sites and availability of prey.

5.2.2.2 High Likelihood

Malleefowl (*Leipoa ocellata*), Vulnerable under the BC Act and EPBC Act

The Malleefowl is found in semi-arid to arid shrublands and low woodlands, especially those dominated by mallee and/or *Acacia*. The species nests in large mounds of dirt and leaf litter up to five metres wide and one metre tall (Menkhorst et al., 2017). Sandy substrates and abundance of leaf litter are required for breeding (Department of the Environment and Energy, 2018). Densities of the birds are generally greatest in areas of higher rainfall and on more fertile soils where there is an abundance of food plants.

The Malleefowl has recently been recorded within 1 km of the Survey Area and is therefore highly likely to use suitable habitat within the Survey Area (Department of Biodiversity Conservation and Attractions, 2022). The *Eucalyptus* Woodland and *Acacia* Shrubland habitats constitute suitable habitat for the taxon. No mounds, tracks, or other signs of the taxon observed during the field survey. When present, these signs are obvious and detectable (National Malleefowl Recovery Team, 2016). While breeding may occur in the Survey Area, it is unlikely that high densities of breeding individuals are present.

Common Sandpiper (*Actitis hypoleucos*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act.

The Common Sandpiper typically feeds on mollusks and crustaceans as well as a variety of insects. It is a migratory species that uses varied coastal and interior wetlands including narrow muddy edges of billabongs, river pools, mangroves, among rocks and snags, reefs or rocky beaches (Morcombe, 2003). It migrates from mid-northern latitudes of Asia (Menkhorst *et al.*, 2017) and likely breeds in the Russian far east (Pizzey and Knight, 2001).

The Common Sandpiper was not recorded during the current field survey, however it has been recorded within the Survey Area previously (Department of Biodiversity Conservation and Attractions, 2022). The taxon may use the Open Water habitat within the Survey Area, particularly the Coolgardie Gorge for foraging and roosting.

Common Greenshank (*Tringa nebularia*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act.

The Common Greenshank is a migratory species to Australia that typically breeds in Norway (BirdLife International, 2016). The species is found in a wide variety of wetlands from coastal to freshwater, where it wades in shallow water foraging for prey, often lunging or probing for fish and invertebrates (Pizzey and Knight, 2001; BirdLife International, 2016; Menkhorst *et al.*, 2017).

The Common Greenshank was not recorded during the current field survey, however, it has been recorded within the Survey Area previously (Department of Biodiversity Conservation and Attractions, 2022). The taxon may use the Open Water habitat within the Survey Area, particularly the Coolgardie Gorge for foraging and roosting.

5.2.2.3 Medium Likelihood

Sharp-tailed Sandpiper (*Calidris acuminata*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act.

The Sharp-tailed Sandpiper is a small-medium migratory wader, nesting in the northern Siberian Tundra and is one of the most common shorebirds to inhabit in fresh and saline wetlands occurring inland in Australia (Menkhorst *et al.*, 2017). In Western Australia there are scattered records of the species occurring along the Nullarbor Plain and the southern areas of the Great Victoria Desert. They are widespread from Cape Arid to Carnarvon, around coastal and subcoastal plains of the Pilbara Region to south-west and east Kimberley (Pizzey and Knight,

2001). It also forages in grasslands and tidal areas. The species typically prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation (Pizzey and Knight, 2001).

The Sharp-tailed Sandpiper was not recorded during the field survey. The nearest record was 15 km northwest of the Survey Area (Department of Biodiversity Conservation and Attractions, 2022). The taxon may use the Open Water habitat within the Survey Area, particularly the Coolgardie Gorge for foraging and roosting.

Curlew Sandpiper (*Calidris ferruginea*), Critically Endangered, International Agreement under the BC Act and Critically Endangered, Migratory and Marine under the EPBC Act.

The Curlew Sandpiper is a small, slim sandpiper that is most commonly found on large tidal flats, occasionally using brackish and freshwater wetland systems (Menkhorst *et al.*, 2017). They typically forage on invertebrates throughout mudflats and nearby shallow water. The species is migratory and nests in Arctic Siberia, and in Western Australia are widespread around coastal and subcoastal plains from Cape Arid to the south-west Kimberley (Pizzey and Knight, 2001).

The Curlew Sandpiper was not recorded during the field survey. The nearest record was 15 km northwest of the Survey Area (Department of Biodiversity Conservation and Attractions, 2022). The taxon may use the Open Water habitat within the Survey Area, particularly the Coolgardie Gorge for foraging and roosting.

Wood Sandpiper (*Tringa glareola*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act.

The Wood Sandpiper is a small, thin wader that uses well-vegetated, shallow, freshwater wetlands such as swamps, billabongs, lakes, pools and waterholes (Menkhorst *et al.*, 2017). The species is generally associated with emergent aquatic plants or grass, and they forage on moist or dry mud at the edges of wetlands. The Wood Sandpiper is a migratory species, breeding in the subarctic Siberia with some individuals migrating to Australia (Menkhorst *et al.*, 2017). In Western Australia the species is widespread but scattered in most regions (Pizzey and Knight, 2001).

The Wood Sandpiper was not recorded during the field survey. The nearest record was 30 km northeast of the Survey Area (Department of Biodiversity Conservation and Attractions, 2022). The taxon may use the Open Water habitat within the Survey Area, particularly the Coolgardie Gorge for foraging and roosting.

Glossy Ibis (*Plegadis falcinellus*), International Agreement under the BC Act and Migratory and Marine under the EPBC Act.

The preferred foraging and breeding habitat of the Glossy Ibis includes fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation (Marchant and Higgins, 1990; del Hoyo, Elliot and Sargatal, 1992). The Glossy Ibis builds a platform nest of sticks in trees or shrubs above

water and typically nests in colonies (Pizzey and Knight, 2013). The distribution of the Glossy Ibis is generally east of the Kimberley in Western Australia and Eyre Peninsula in South Australia. The species is also known to be patchily distributed in the rest of Western Australia (Department of the Environment and Energy, 2020).

The Glossy Ibis was not recorded during the field survey, however, it has been recorded 27 km northeast of the Survey Area in Kalgoorlie (Department of Biodiversity Conservation and Attractions, 2022). The taxon may use the Open Water habitat within the Survey Area, particularly the Coolgardie Gorge for foraging and roosting.

5.3 Invertebrates

Although outside the scope of this report, two conservation significant invertebrates were identified as potentially occurring within the Survey Area.

Arid Bronze Azure Butterfly (*Ogyris subterrestris petrina*), Critically Endangered under the BC Act and EPBC Act.

Following the extirpation of the only known population in the early 1990s, the Arid Bronze Azure Butterfly (ABAB) was rediscovered at Barbalin Nature Reserve in 2006. The ABAB can only reproduce where nests of the sugar ant, *Camponotus* sp. nr. *terebrans* are present. The ants protect the larvae from predators and in return, the ants feed on secretions produced by the ABAB larvae. Unlike other species in this genus, the ABAB larva do not eat vegetation and are entirely dependent upon the host ant. The ABAB larvae require large ant colonies that are typically found at the base of many species of smooth-barked eucalypts including *Eucalyptus salubris* and *E. salmonophloia* (Department of Biodiversity Conservation and Attractions, 2020b).

The presence of multiple smooth-barked eucalypt species within the known distribution of the host ant *Camponotus* sp. nr. *terebrans* suggests that suitable habitat for the ABAB may occur within the survey area. The presence of potentially suitable ABAB habitat within the range of the host ant requires surveys to determine the presence and density of *Camponotus* sp. nr. *terebrans* colonies (Department of Biodiversity Conservation and Attractions, 2020a, 2020b). Consequently, a targeted survey for host ant colonies was conducted in Dec 2021. The results of this survey are presented in a separate report in preparation (360 Environmental 2022, in prep).

Inland Hairstreak (*Jalmenus aridus*), Priority 1 under the BC Act.

Jalmenus aridus is one of ten currently recognised species in the genus *Jalmenus*, which is found only in Australia. *Jalmenus* species feed openly on the foliage of their respective host plants, and all are attended by specific ant species. *Jalmenus aridus* is attended by the ant species *Froggattella kirbii* (Sands and New, 2002). *Jalmenus aridus* is protected by the ants from predators and parasitoids and the butterfly caterpillars reward the ants with sweet liquid produced in special organs.

The butterfly is only present in its adult form for short periods of time (perhaps only two to three weeks at a given site). Timing of adult emergence is linked to rainfall patterns, plant growth stages and other ecological conditions with most likely flight times from mid-October to mid-November.

The ant, *Froggattella kirbii* is found from near Perth to the East coast of Australia ad is associated with two known host plants. One host plant, *Senna nemophila* (*artemisioides*), is found over most of central and eastern WA while the other known host plant, *Acacia tetragonophylla,* is found almost everywhere in WA except the very far north and far south.

During the surveys, it was observed that suitable habitat was present within the Survey Area. Additional targeted surveys will be required to confirm the presence of *Jalmenus aridus* within the Survey Area.

6 Conclusion

Flora and Vegetation

- No Threatened Listed flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act 2016 were recorded
- Ten individuals of *Austrostipa blackii* (P3), were recorded in one quadrat (C1Q01)
- Thirteen introduced species were recorded during the survey, of which one, **Opuntia stricta*, is a Declared Pest and listed as a WoNS
- Ten vegetation types were mapped within the Survey Area, none of which were analogous to conservation significant ecological communities.

Vertebrate Fauna

- Five fauna habitats were mapped, of which the *Eucalyptus* Woodland, *Acacia* Shrubland, and Open Water habitat types represent the most value to conservation significant fauna and overall fauna assemblages. A naturally occurring pool at Coolgardie Gorge was of particularly value to water birds and to the overall fauna assemblage.
- One conservation significant species, the Western Quoll, Chuditch (*Dasyurus geoffroii fortis*), which is listed as Vulnerable under the BC Act and EPBC Act, was recorded within the Survey Area. Chuditch scat was observed during the field survey.
- Seven introduced species were recorded during the survey, Goat (*Capra hircus*), European Cattle (*Bos primigenius taurus*), Dog/Dingo (*Canis familiaris*), Red fox (*Vulpes vulpes*), Horse (*Equus caballus*), Cat (*Felis catus*) and Rabbit (*Oryctolagus cuniculus*).
- One significant fauna species, the Western Quoll, Chuditch (*Dasyurus geoffroii fortis*) which is listed as Vulnerable under the BC Act and EPBC Act, was recorded within the Survey Area based on a scat observed during the field survey.
- Although outside the scope of this report, potential habitat for Arid Bronze Azure Butterfly (*Ogyris subterrestris petrina*), which is listed as Critically Endangered under the BC Act and EPBC Act, and the Inland Hairstreak butterfly (*Jalmenus aridus*), which is listed as Priority 1 by the DBCA, was observed within the Survey Area.

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It is important to recognise that site conditions, including the extent and concentration of contaminants, can change with time. This is particularly relevant if this report, including the data, opinions, conclusions, and recommendations it contains, are to be used a considerable time after it was prepared. In these circumstances, further investigation of the site may be necessary.

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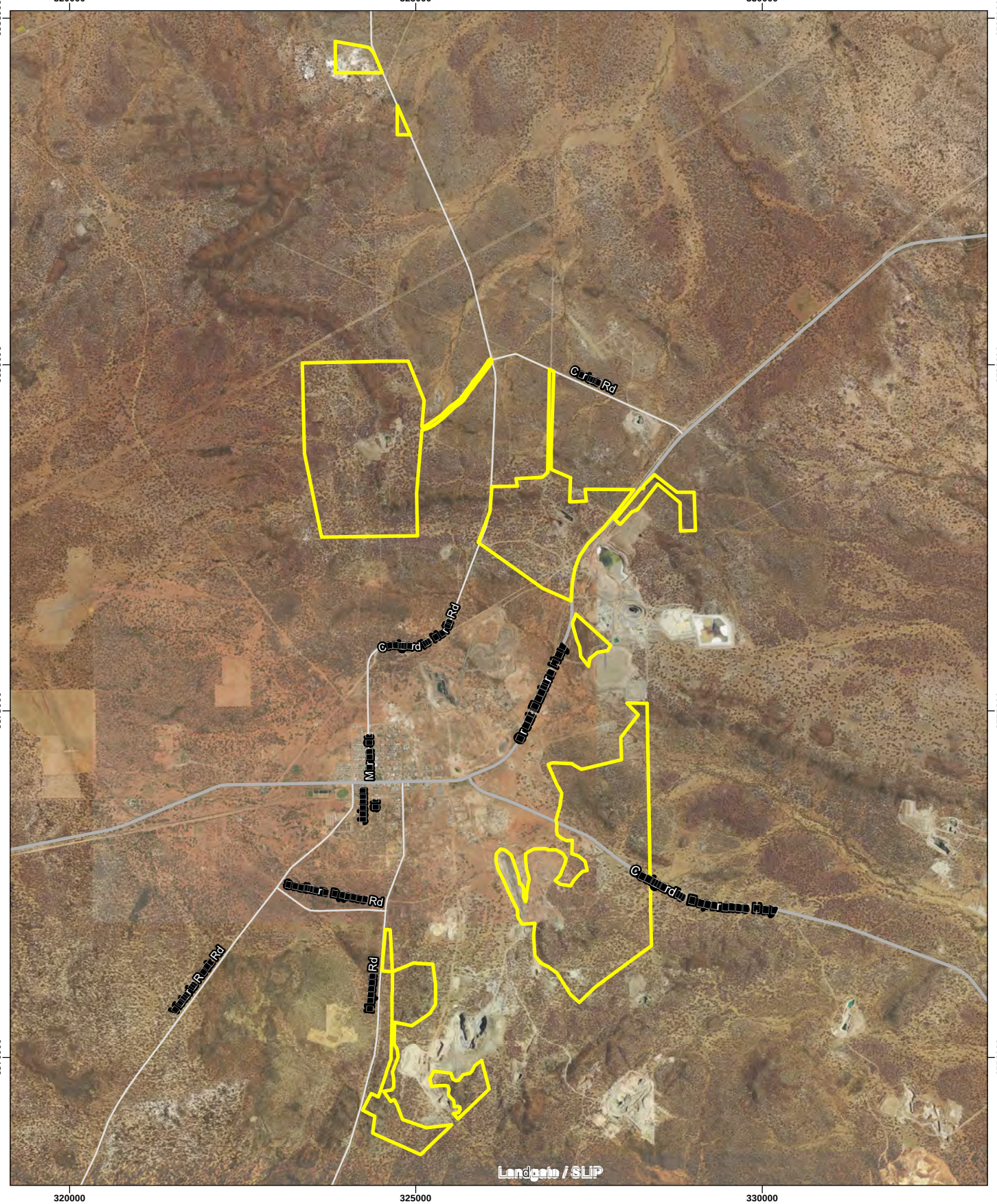
Figures



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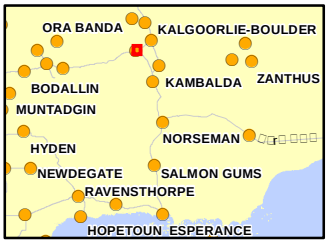

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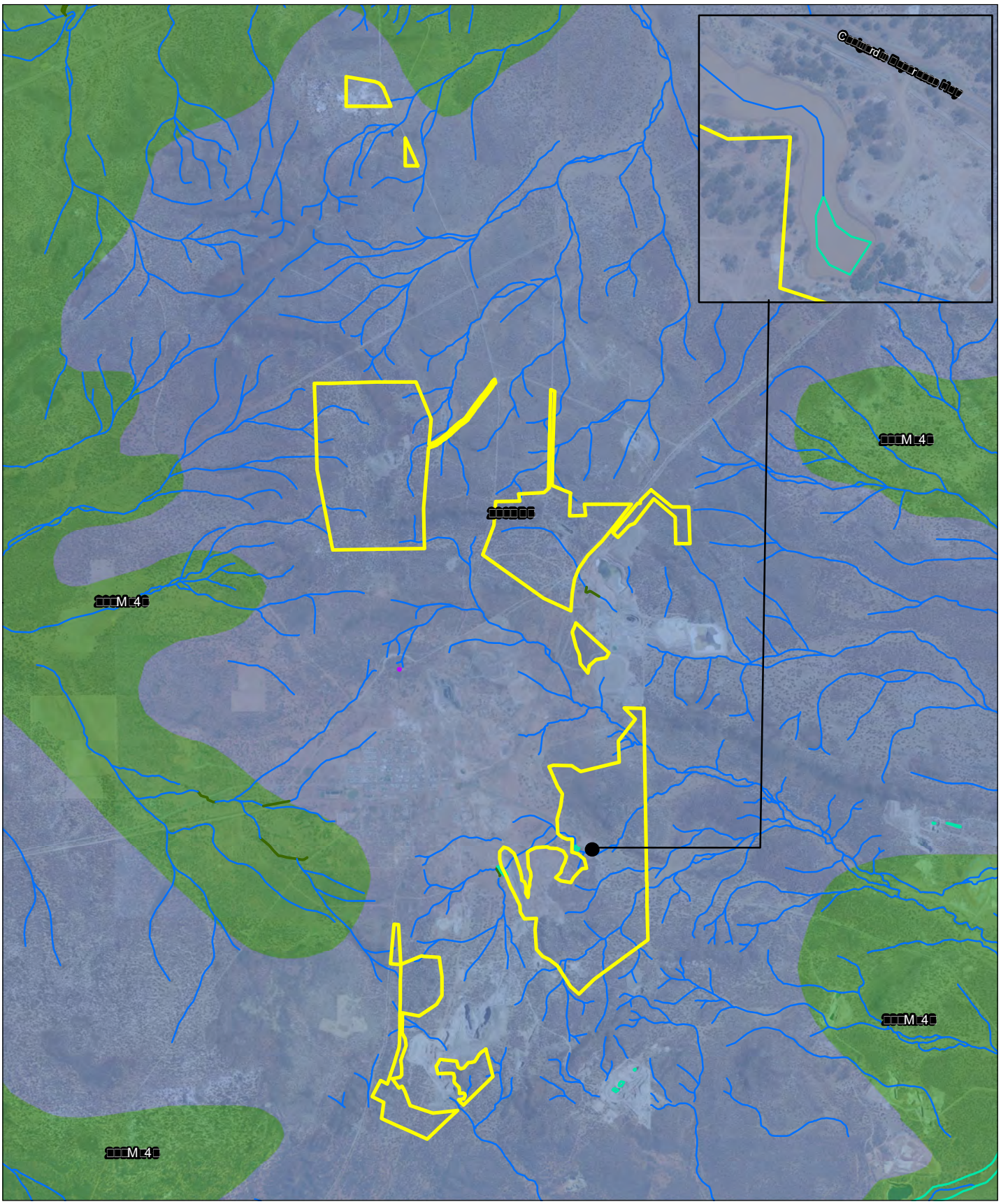

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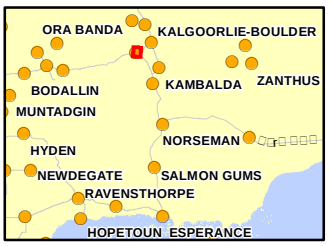

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CNX Three Mile Hill Coolgardie Gold Project

Figure 2
Soil Landscapes and Land Systems and Hydrography

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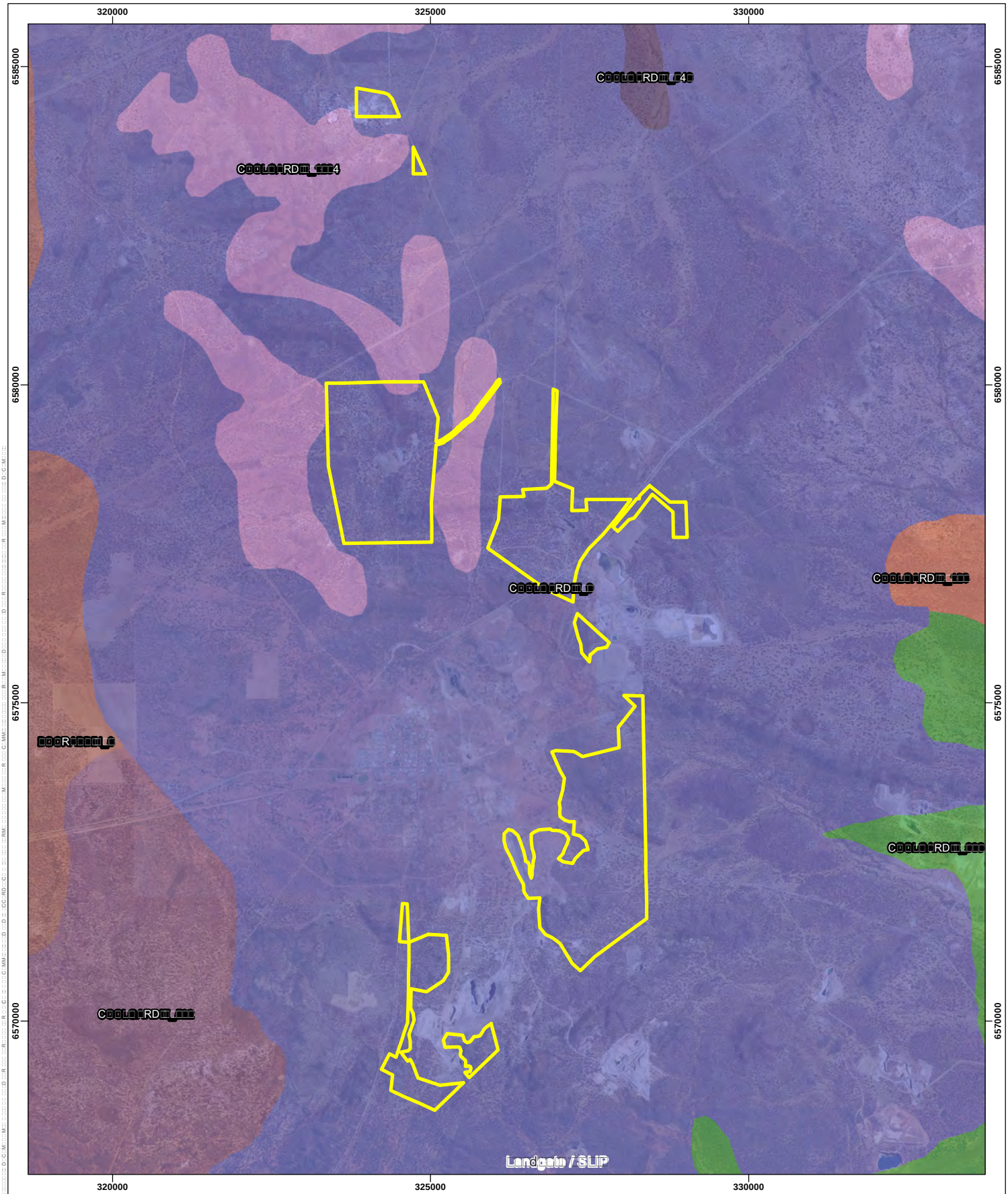

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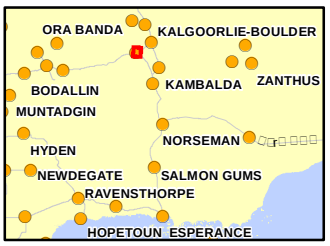

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Figure 3
Broad Vegetation Types

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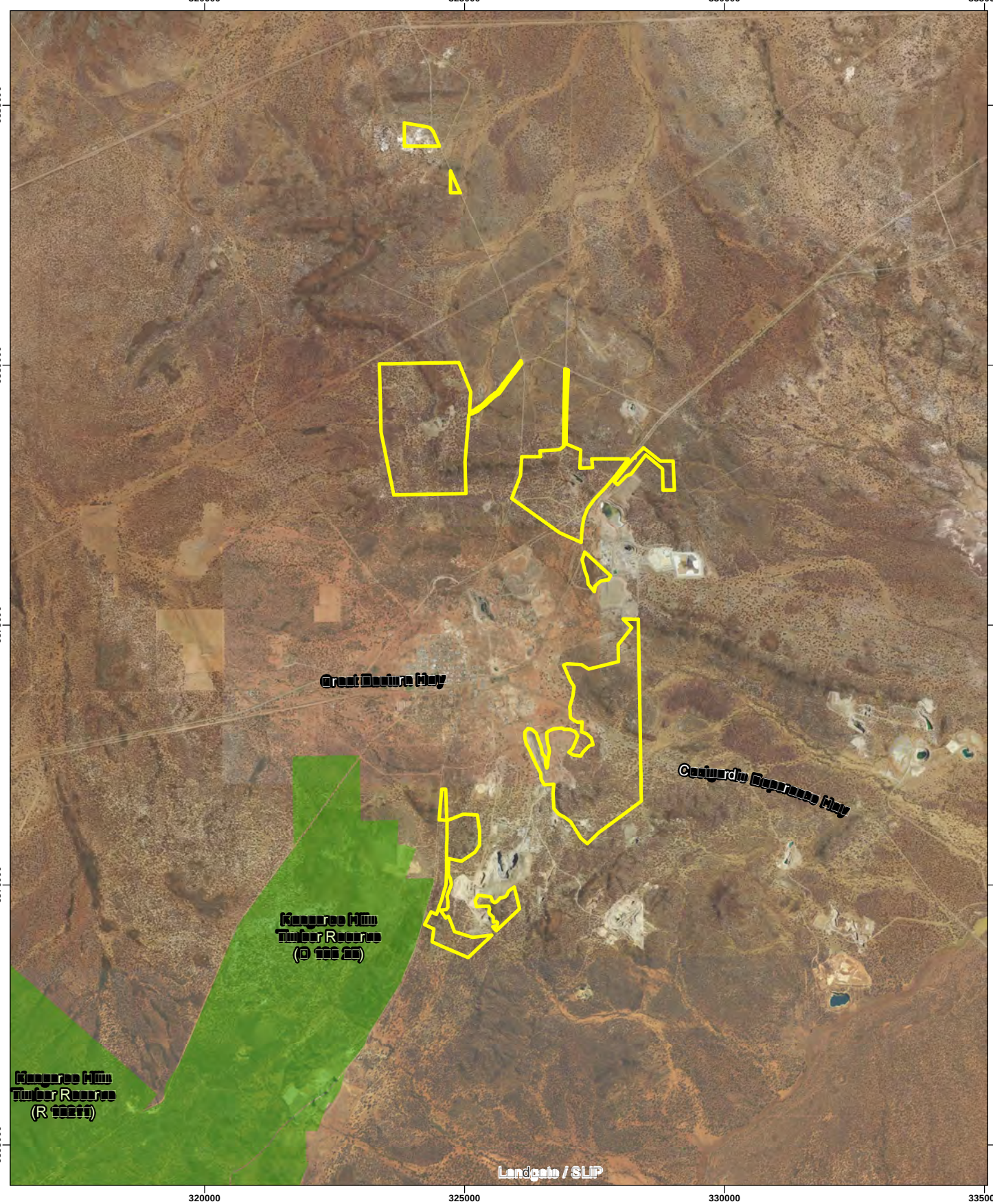

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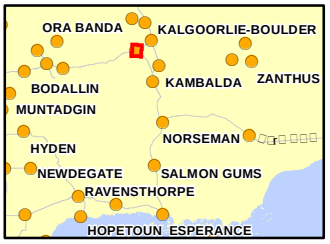

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Figure 4

Conservation Areas

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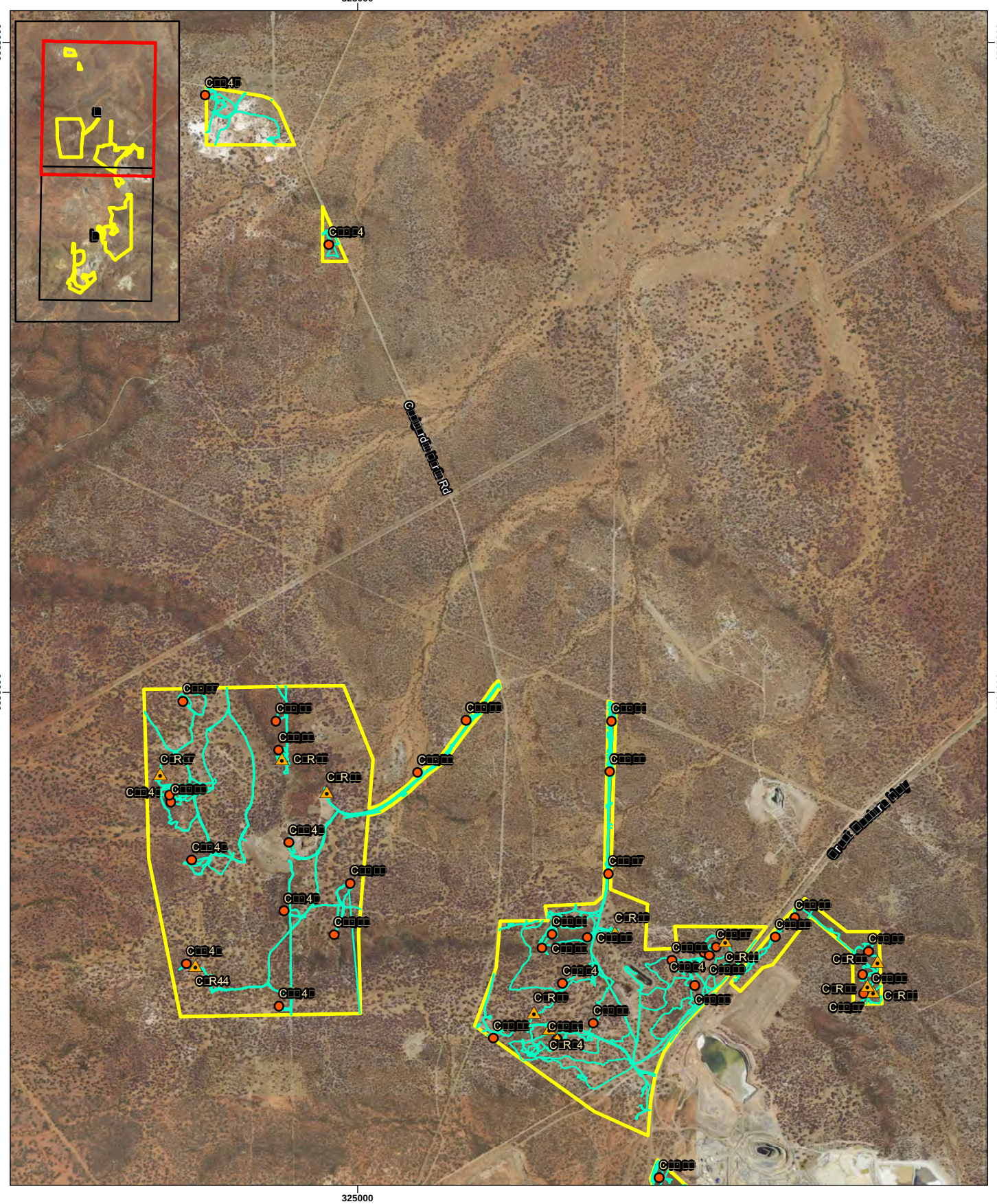

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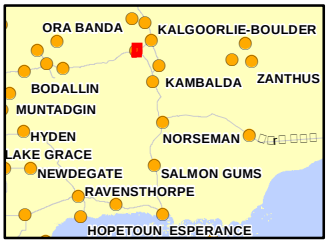

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Figure 5a

Survey Effort

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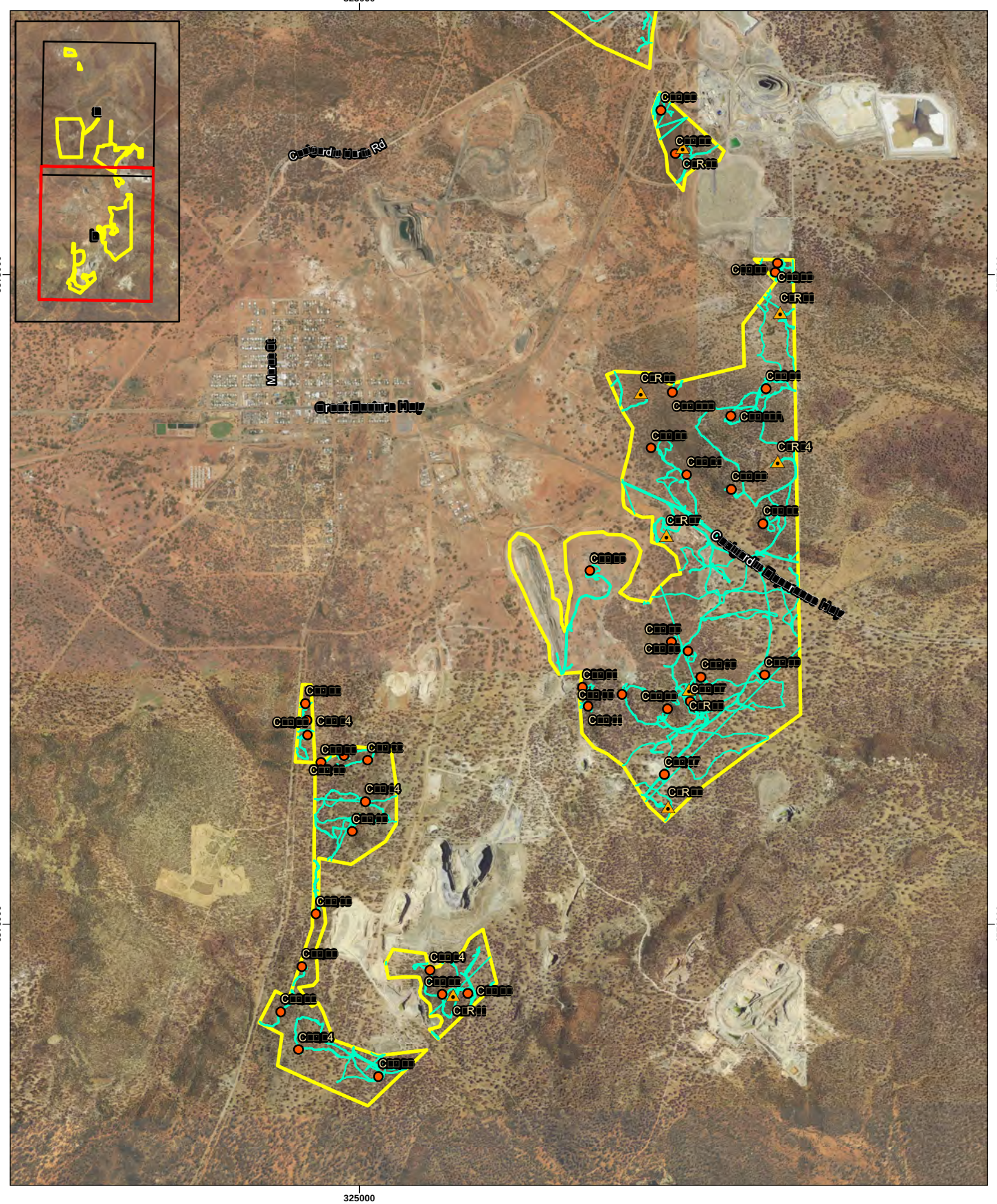

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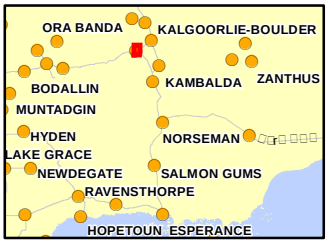

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Figure 5b

Survey Effort

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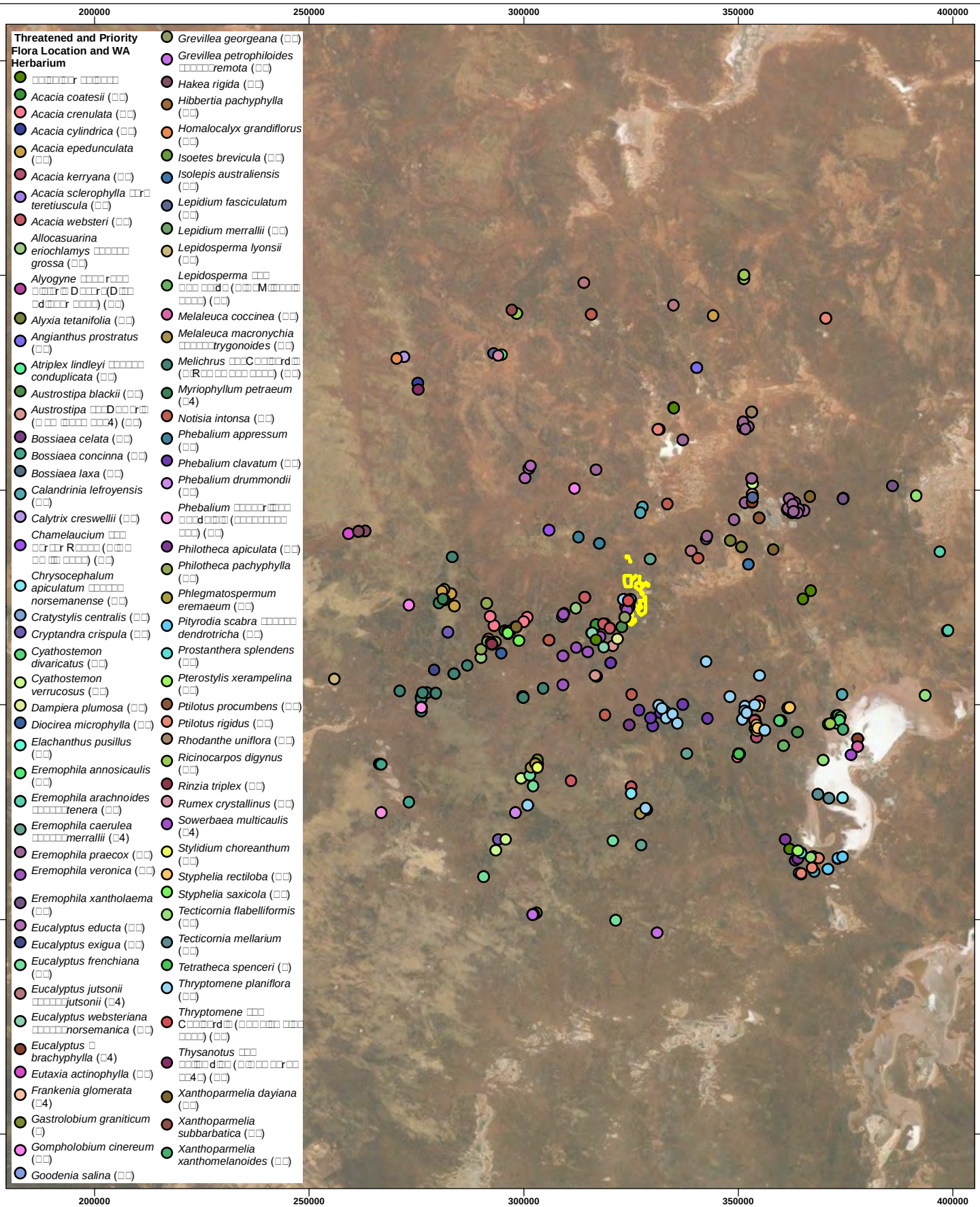
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Cryptandra crispula (□□)
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Dampiera plumosa (□□)
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Eremophila annosicaulis (□□)
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Eremophila caerulea □□□□□□merrallii (□4)
Eremophila praecox (□□)
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Eremophila xantholaema (□□)
Eucalyptus educta (□□)
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Isoetes brevicula (□□)
Isolepis australiensis (□□)
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Philotheca pachyphylla (□□)
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Pityrodia scabra □□□□□□ dendrotricha (□□)
Prostanthera splendens (□□)
Pterostylis xerampelina (□□)
Ptilotus procumbens (□□)
Ptilotus rigidus (□□)
Rhodanthe uniflora (□□)
Ricinocarpos digynus (□□)
Rinzia triplex (□□)
Rumex crystallinus (□□)
Sowerbaea multicaulis (□4)
Stylidium choreanthum (□□)
Styphelia rectiloba (□□)
Styphelia saxicola (□□)
Tecticornia flabelliformis (□□)
Tecticornia mellarium (□□)
Tetratheca spenceri (□)
Thryptomene planiflora (□□)
Thryptomene □□□ C□□□□rd□□ (□□□□□□ □□□□ □□□□) (□□)
Thysanotus □□□ □□□□d□□ (□□□□ □□r□□ □□4□) (□□)
Xanthoparmelia dayiana (□□)
Xanthoparmelia subbarbatica (□□)
Xanthoparmelia xanthomelanoides (□□)
Legend
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0
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LOCALITY MAP
ORA BANDA
KALGOORLIE-BOULDER
BODALLIN
KAMBALDA
ZANTHUS
MUNTADGIN
NORSEMAN
HYDEN
NEWDEGATE
SALMON GUMS
RAVENSTHORPE
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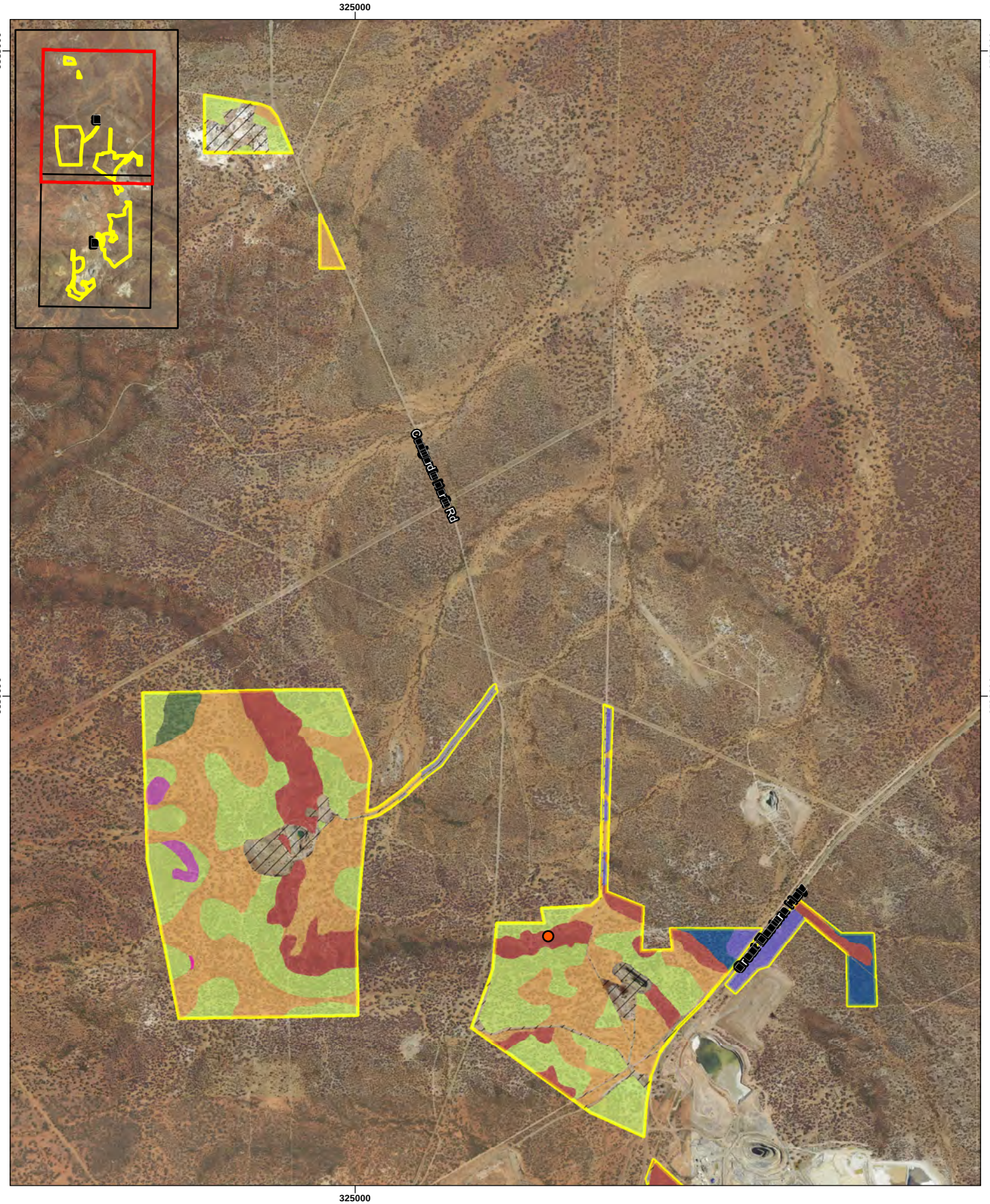
Focus Mineral Limited
CNX Three Mile Hill Coolgardie Gold Project
Figure 6
DBCA Threatened and Priority Flora Locations



Legend

□□r□□□ □r□□ — *Austrostipa blackii* (□□)

Vegetation Types

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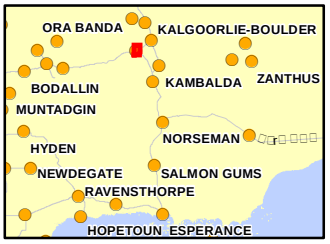
LOCALITY MAP



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CNX Three Mile Hill Coolgardie Gold Project

Figure 7a
Vegetation Types

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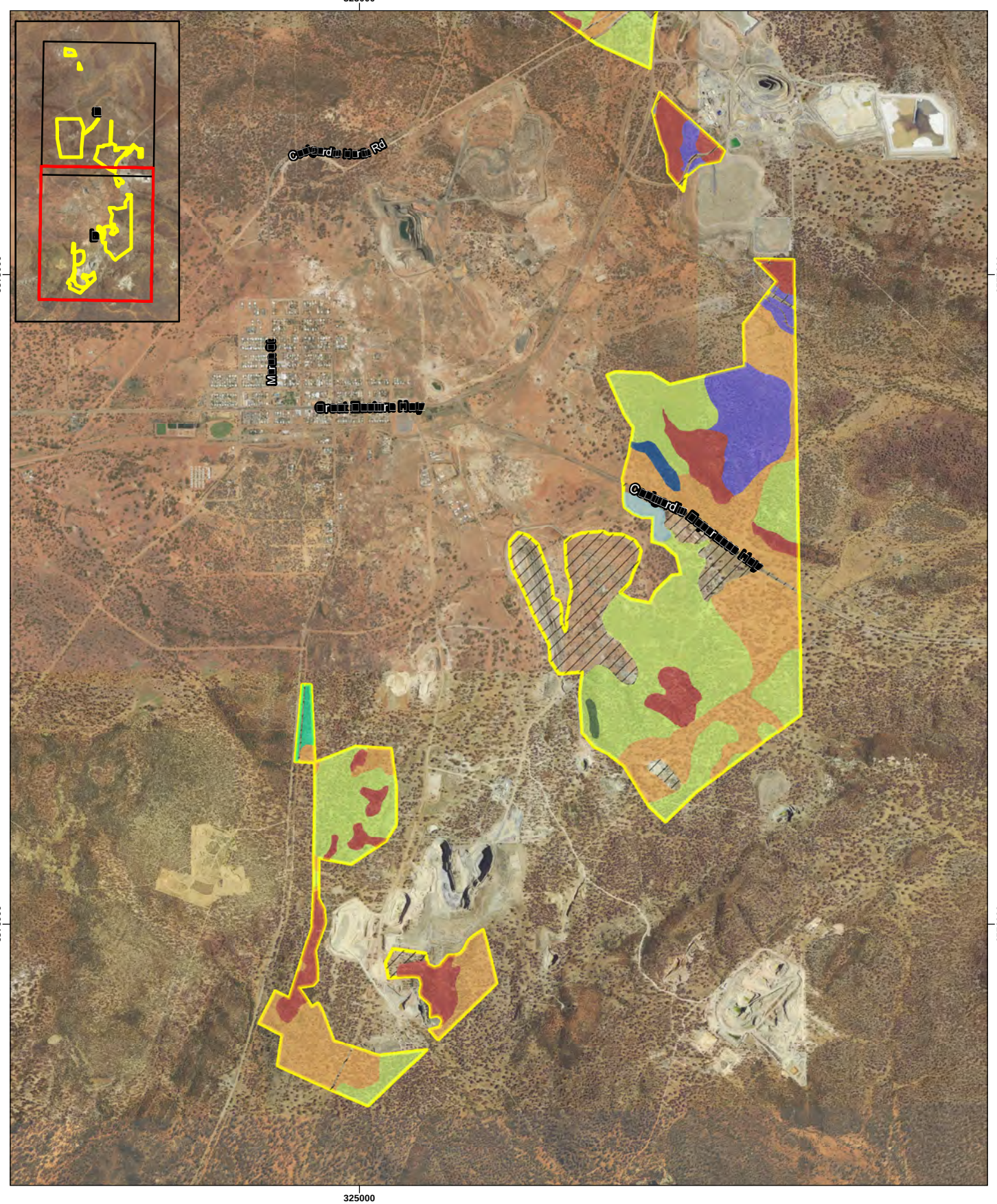

Legend

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- **Vegetation Types**
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LOCALITY MAP

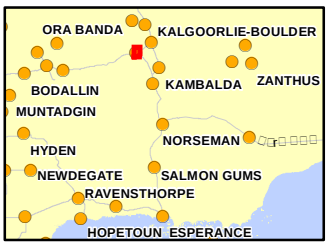

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Figure 7b
Vegetation Types

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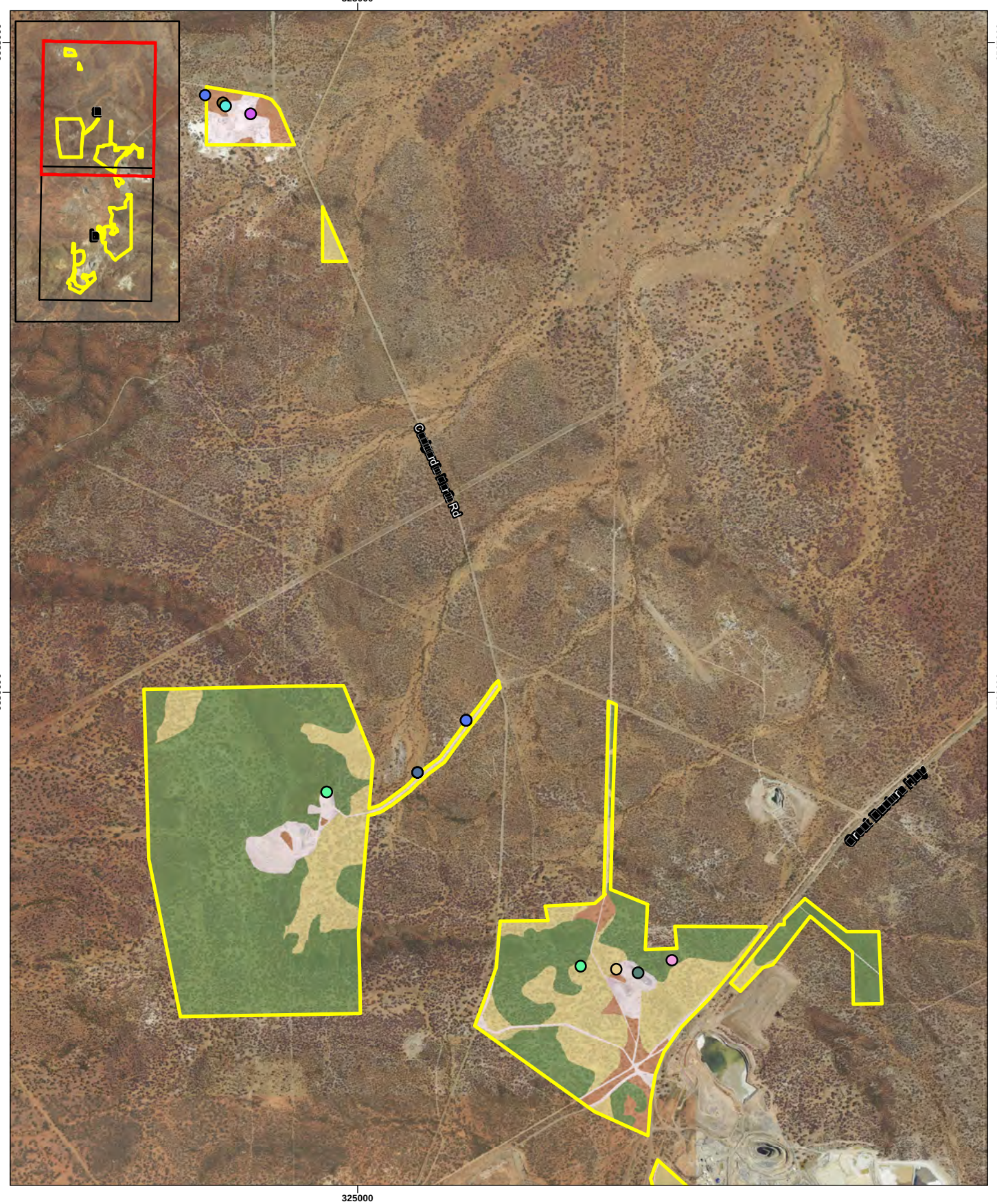

Legend

Weed Species

- *Agave americana*
- *Carrichtera annua*
- *Centaurea melitensis*
- *Crassula ovata*
- *Nicotiana glauca*
- *Oligocarpus calendulaceus*
- *Rumex vesicarius*
- *Salvia verbenaca*
- *Schinus molle* var. *areira*

Vegetation Condition

0 420 840 1,260 Meters
1:40,000 @ A4

N

LOCALITY MAP

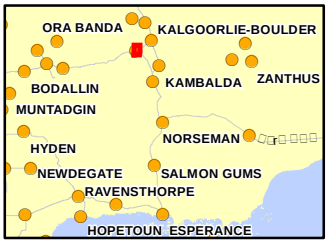

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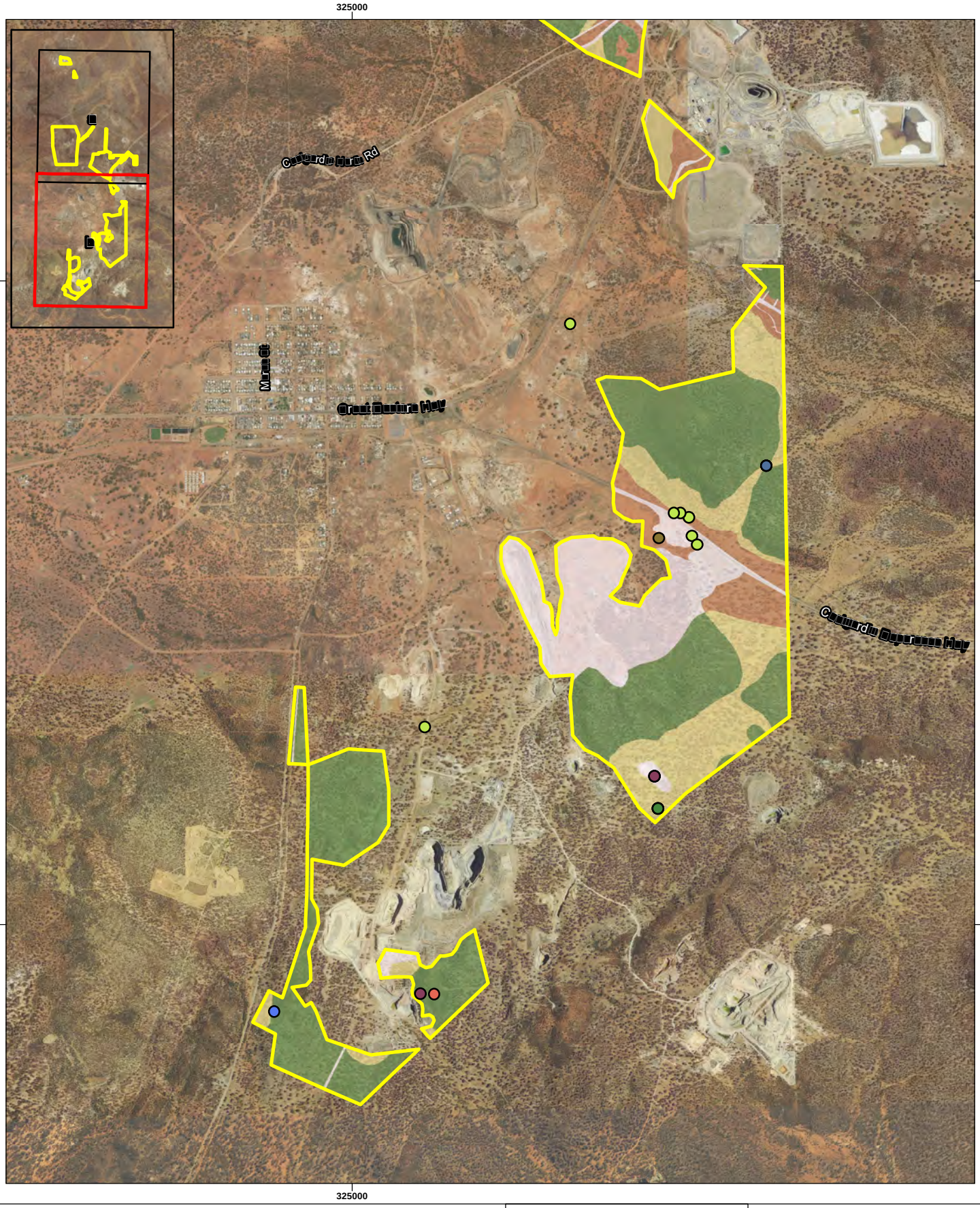
Figure 8a
Vegetation Condition



Legend

Weed Species

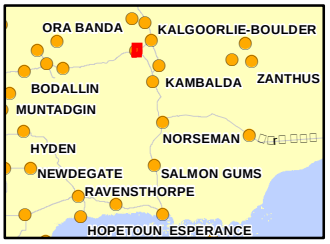
- *Asphodelus fistulosus*
- *Carrichtera annua*
- *Centaurea melitensis*
- *Euphorbia drummondii*
- *Heliotropium europaeum*
- *Oligocarpus calendulaceus*
- *Opuntia stricta*
- *Salvia verbenaca*
- *Schinus molle* var. *areira*
- *Sonchus asper*

Vegetation Condition

0 420 840 1,260 Meters
1:40,000 @ A4

N

LOCALITY MAP



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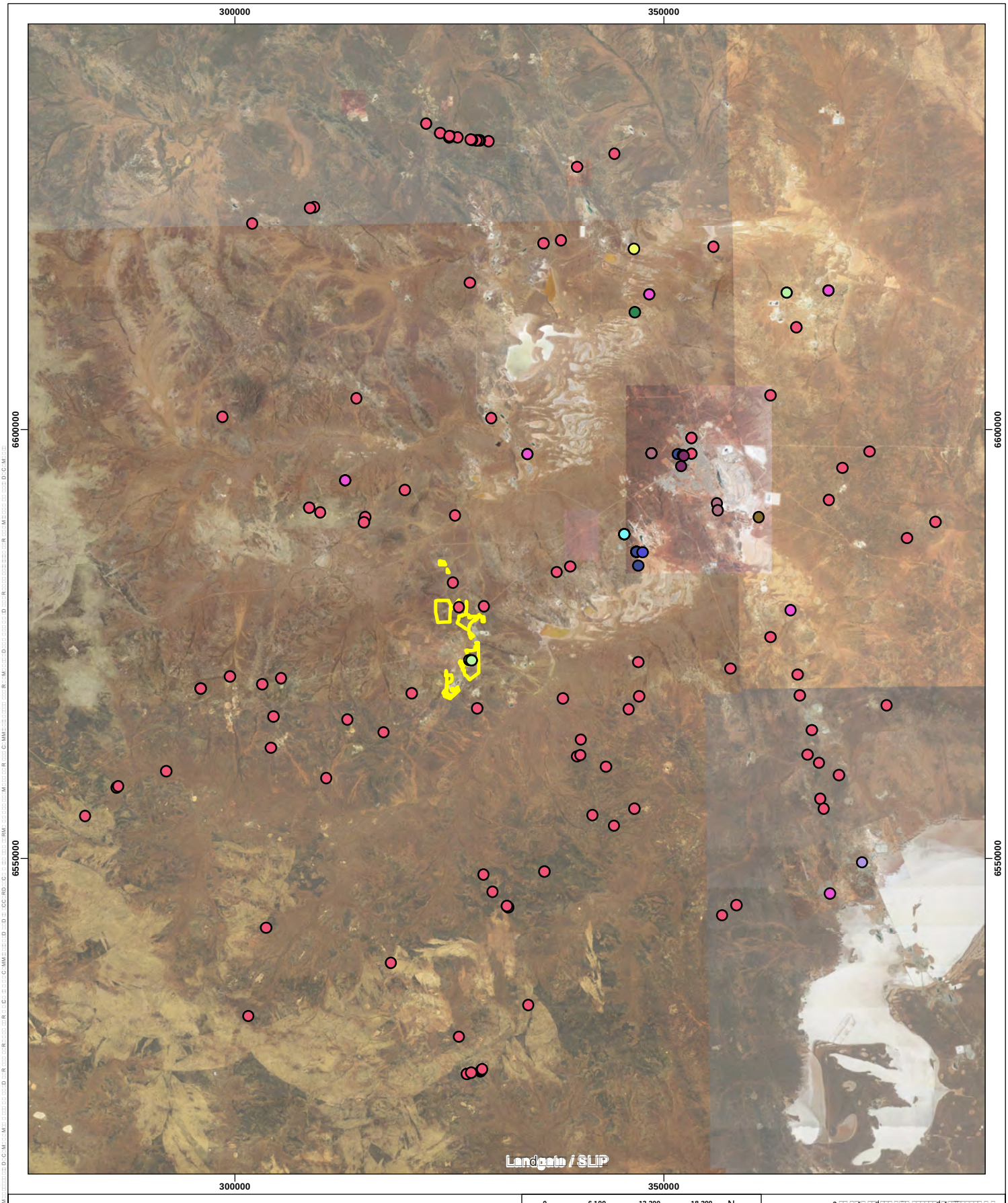
Focus Mineral Limited

CNX Three Mile Hill Coolgardie Gold Project

Figure 8b
Vegetation Condition



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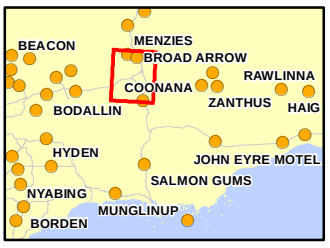
LOCALITY MAP



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CNX Three Mile Hill Coolgardie Gold Project

Figure 9

DBCA Threatened and Priority Fauna Records

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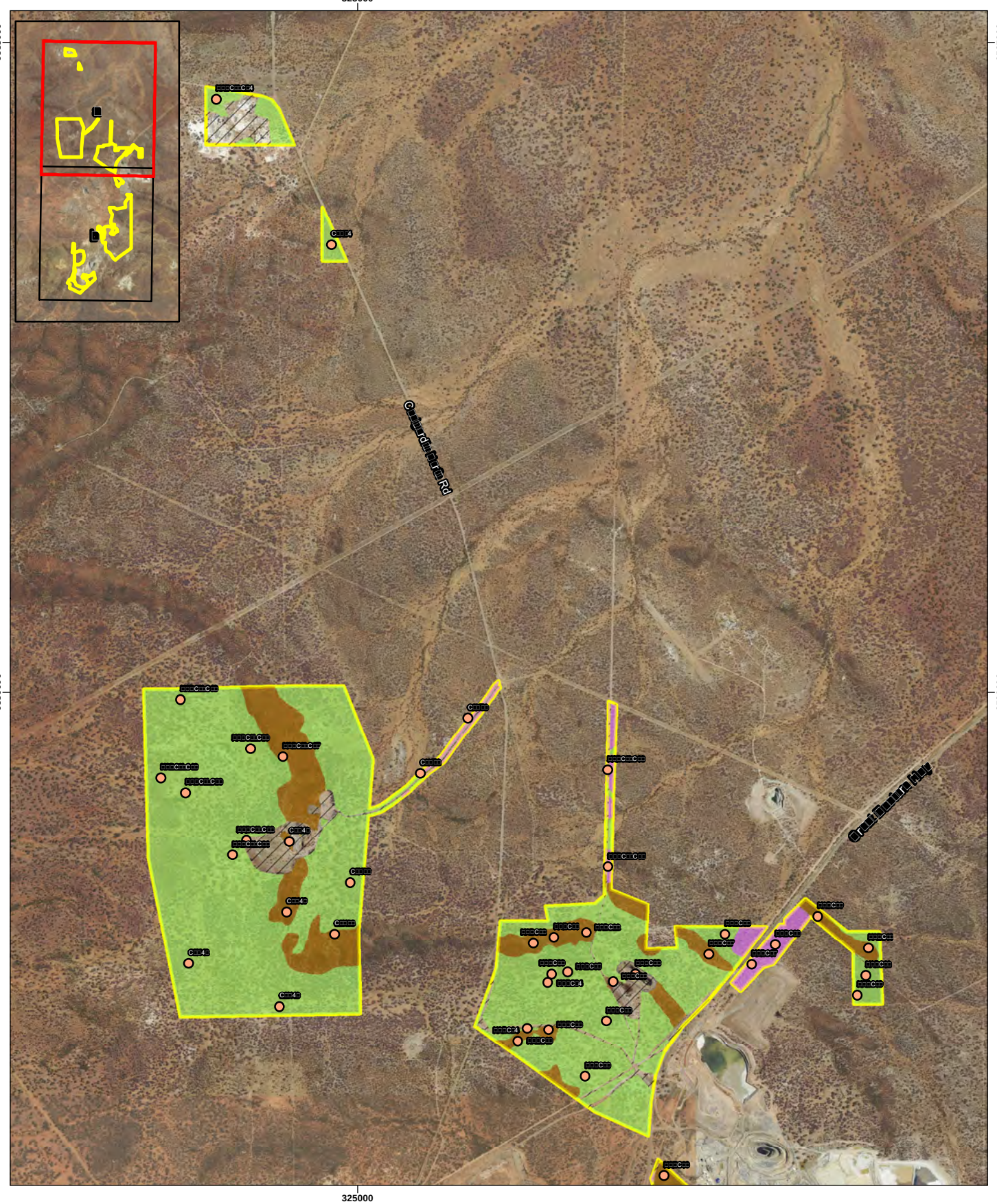

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Fauna Habitat

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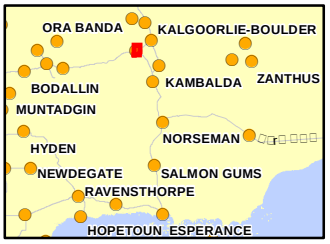
LOCALITY MAP



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HORIZONTAL DATUM AND PROJECTION

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CNX Three Mile Hill Coolgardie Gold Project

Figure 10a

Fauna Habitat

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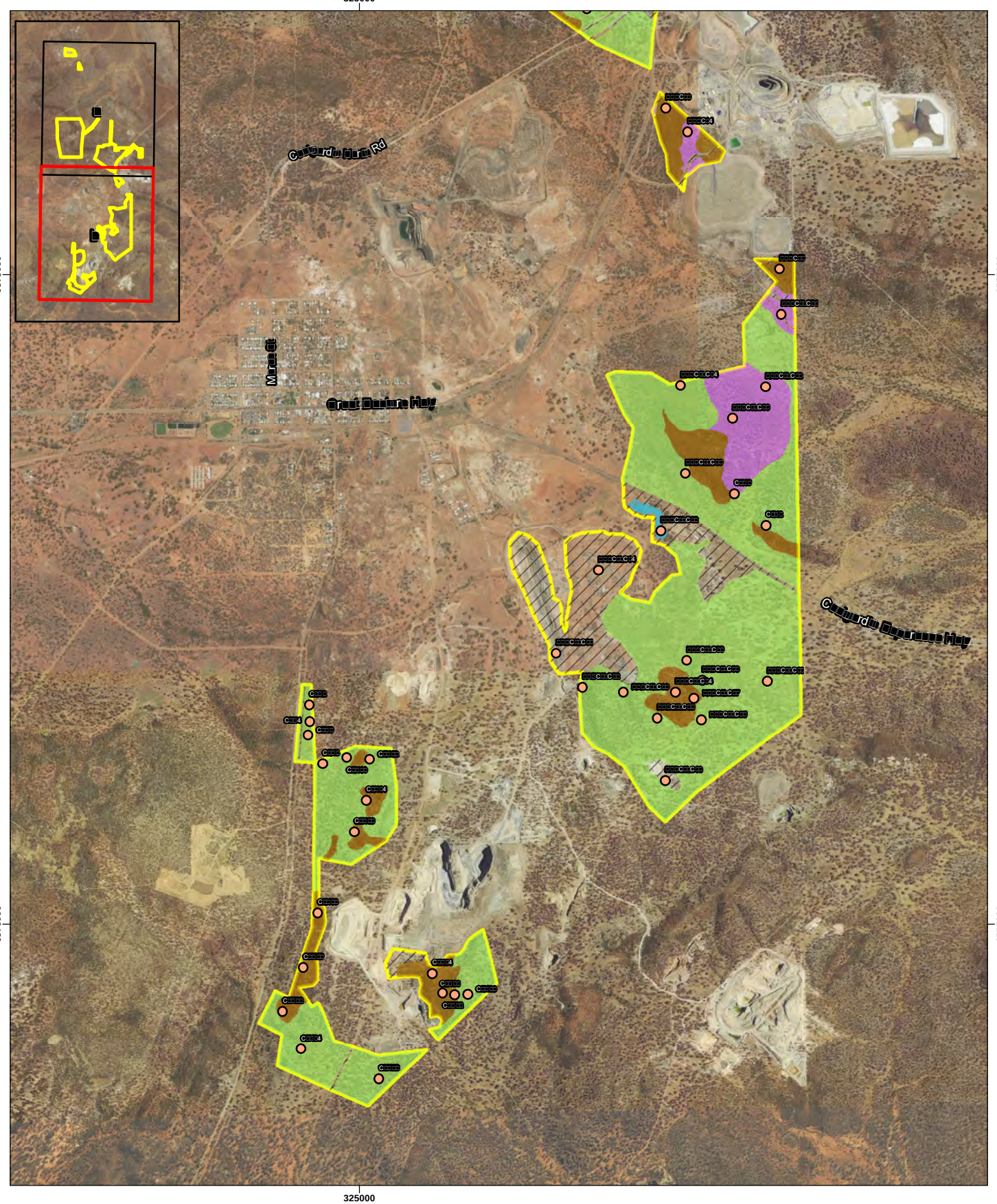

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Fauna Habitat

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- □ □□□ □ □□r
- R□□□□ □□□□□
- C□□r□d

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Meters

1:40,000 @ A4

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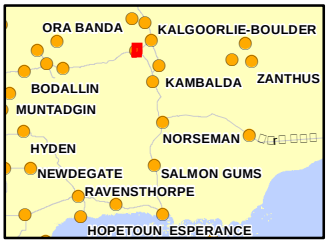
LOCALITY MAP



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Focus Mineral Limited

CNX Three Mile Hill Coolgardie Gold Project

Figure 10b
Fauna Habitat

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Appendices

Appendix A
Flora and Fauna Literature Review

Appendix A: Fauna Literature Review

Report	Distance to current Survey Area	Survey timing	Survey effort	Recorded conservation significant fauna	Fauna habitats
Coolgardie landfill Flora, Vegetation and Fauna Habitat Assessment (Stategen Environmental 2019)	6.4 kms ESE of Survey Area	18 December 2018	Describe fauna habitat within the Survey Area	None	Open mallee woodland to mallee woodland.
Fauna survey for Mungari Gold Operations Cutters Ridge Project (Phoenix Environmental Sciences, 2019)	40 km North of Survey Area	September 2018	Level 1 Fauna Targeted Malleefowl	Malleefowl (*Leipoa ocellata*)	Open Eucalypt woodland, shrubland, and salt lake, in addition to a small portion of existing cleared areas.
Level 1 Vertebrate Fauna Risk Assessment for Lot 500 Kalgoorlie West (Terrestrial Ecosystems, 2018)	24 km NE of Survey Area	2018	Level 1 Vertebrate Fauna	None	Open eucalypt woodland with a mixed understory of scattered shrubs and chenopods
Vegetation Clearing - Fauna Assessment (Biostat Pty Ltd, 2020)	40 km N of the Survey Area	December 2019	Level 1 Reconnaissance	None	Open woodland: Acacia, Casuarina, and Eucalypt. Chenopod shrubland, Acacia shrubland. Eucalyptus sp. mallee over spinifex Stoney/rocky hills Drainage lines Mulga woodland

Appendix B
Flora and Fauna Database Searches

Appendix B: DBCA Threatened and Priority Fauna

CLASS	SCI_NAME	COM_NAME	WA_status	EPBCstatus	YEAR	SOURCE	CERTAINTY	OBS_METHOD	OBS_TYPE	COUNT	LOCALITY	SITE
Actitis hypoleucos	Common Sandpiper	BIRD	MI	MI	2014	BIRDATA				0	coolgardie gorge	coolgardie gorge
Actitis hypoleucos	Common Sandpiper	BIRD	MI	MI	2011	BIRDATA				0	The Gorge (Coolgardie0	The Gorge (Coolgardie0
Actitis hypoleucos	Common Sandpiper	BIRD	MI	MI	2013	BIRDATA				0	Coolgardie Gorge wetland	Coolgardie Gorge wetland
Tringa nebularia	Common greenshank, greenshank	BIRD	MI	MI	2013	BIRDATA				0	Coolgardie Gorge wetland	Coolgardie Gorge wetland
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	2012	BIRDATA				0	Silver Lake	Silver Lake
Calidris alba	Sanderling	BIRD	MI	MI	2016	BIRDATA				0	Hannan Lake	Hannan Lake
Calyptorhynchus lati	Carnaby's cockatoo	BIRD	EN	EN	2016	BIRDATA				0	367 Collins	367 Collins
Calyptorhynchus lati	Carnaby's cockatoo	BIRD	EN	EN	2016	BIRDATA				0	Cape Lilac on alley	Cape Lilac on alley
Calyptorhynchus lati	Carnaby's cockatoo	BIRD	EN	EN	2017	BIRDATA				0	Piccadilly St West	Piccadilly St West
Tringa brevipes	Grey-tailed tattler	BIRD	P4	MI	2017	BIRDATA				0	Lake Douglas	Lake Douglas
Tringa nebularia	Common greenshank, greenshank	BIRD	MI	MI	1980	BIRDATLAS1				0	KANOWNA	KANOWNA
Tringa glareola	Wood sandpiper	BIRD	MI	MI	1980	BIRDATLAS1				0	KARLKURLA	KARLKURLA
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	1980	BIRDATLAS1				0	KARLKURLA	KARLKURLA
Thinornis rubricollis	Hooded plover, hooded dotterel	BIRD	P4		1980	BIRDATLAS1				0		
Tringa nebularia	Common greenshank, greenshank	BIRD	MI	MI	1980	BIRDATLAS1				0	KANOWNA	KANOWNA
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	1980	BIRDATLAS1				0	FEYSVILLE	FEYSVILLE
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	1981	BIRDATLAS1				0	KARLKURLA	KARLKURLA
Plegadis falcinellus	Glossy ibis	BIRD	MI	MI	1981	BIRDATLAS1				0	KARLKURLA	KARLKURLA
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	1981	BIRDATLAS1				0	KANOWNA	KANOWNA
Tringa nebularia	Common greenshank, greenshank	BIRD	MI	MI	2001	BIRDATLAS2				0	Kopai Lake	Kopai Lake
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	2001	BIRDATLAS2				0	Kopai Lake	Kopai Lake
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	2001	BIRDATLAS2				0	Kopai Lake	Kopai Lake
Tringa glareola	Wood sandpiper	BIRD	MI	MI	2005	BIRDATLAS2				0	Kalgoorlie Sewerage overflow ponds	Kalgoorlie Sewerage overflow ponds
Tringa glareola	Wood sandpiper	BIRD	MI	MI	2005	BIRDATLAS2				0	Kalgoorlie Sewerage outlet	Kalgoorlie Sewerage outlet
Tringa nebularia	Common greenshank, greenshank	BIRD	MI	MI	2006	BIRDATLAS2				0	Young River Station Lake	Young River Station Lake
Calidris ferruginea	curlew sandpiper	BIRD	CR	CR	2006	BIRDATLAS2				0	Young River Station Lake	Young River Station Lake
Calidris ruficollis	Red-necked stint	BIRD	MI	MI	2006	BIRDATLAS2				0	Young River Station Lake	Young River Station Lake
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	2006	BIRDATLAS2				0	Young River Station Lake	Young River Station Lake
Tringa nebularia	Common greenshank, greenshank	BIRD	MI	MI	1999	BIRDATLAS2				0	Kurnalpi Road	Kurnalpi Road
Calidris ferruginea	curlew sandpiper	BIRD	CR	CR	1999	BIRDATLAS2				0	Kurnalpi Road	Kurnalpi Road
Calidris acuminata	Sharp-tailed sandpiper	BIRD	MI	MI	1999	BIRDATLAS2				0	Kurnalpi Road	Kurnalpi Road
Leipoa ocellata	Malleefowl	BIRD	VU	VU	2012	FAUNASURVEY	Certain	Survey	Unknown	1	FEYSVILLE	Kalgoorlie, Goldfields, Mt Martin
Leipoa ocellata	Malleefowl	BIRD	VU	VU	2012	FAUNASURVEY	Certain	Survey	Unknown	1	FEYSVILLE	Kalgoorlie Region, Goldfields, Jubilee mine
Leipoa ocellata	Malleefowl	BIRD	VU	VU	2012	FAUNASURVEY	Certain	Survey	Unknown	1	FEYSVILLE	Kalgoorlie Region, Goldfields, Jubilee mine
Leipoa ocellata	Malleefowl	BIRD	VU	VU	2012	FAUNASURVEY	Certain	Survey	Unknown	1	FEYSVILLE	Kalgoorlie Region, Goldfields, Jubilee mine
Leipoa ocellata	Malleefowl	BIRD	VU	VU	2012	FAUNASURVEY	Certain	Survey	Unknown	1	FEYSVILLE	Kalgoorlie Region, Goldfields, Jubilee mine
Leipoa ocellata	Malleefowl	BIRD	VU	VU	2012	FAUNASURVEY	Certain	Survey	Unknown	1	BULONG	Hampton Hill, Bulong Mining Lease M25/333
Dasyurus geoffroii	chuditch, western quoll	MAMMAL	VU	VU	1974	TFAUNA	Certain	Opportunistic sighting	Caught or trapped	1	Kambalda East	1 mile N of Kambalda East townsite, at edge of Lake Lefroy in sandy mulga country
Leipoa ocellata	malleefowl	BIRD	VU	VU	1994	TFAUNA	Certain	Opportunistic sighting	Secondary sign	0	Bullabulling	one active nest at Bullabulling No. 8 Pumping station.
Leipoa ocellata	malleefowl	BIRD	VU	VU	1995	TFAUNA	Moderately certain	Opportunistic sighting	Day sighting	1	Londonderry	Yerilla Sandalwood Reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	2000	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Mount Burges	access road to Kundana Mining Lease - "30km NW (10km W & 22km N) of Kalgoorlie"
Branchinella denticu	a fairy shrimp (Carnavon to Kalgoorlie)	INVERTEBRATE	P3		1937	TFAUNA	Certain	Historical (written)	Caught or trapped	0	Gidgi Lake	Gidji Lake, N of Kalgoorlie
Thinornis rubricollis	hooded plover, hooded dotterel	BIRD	P4		1992	TFAUNA	Certain	Survey	Sighting	0	Arrow Lake	Arrow Lake
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1989	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas, 12 km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1991	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas, 12 km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1982	TFAUNA	Certain	Survey	Caught or trapped	2	Lake Douglas	Lake Douglas, 12 km SW of Kalgoorlie

CLASS	SCI_NAME	COM_NAME	WA_status	EPBCstatus	YEAR	SOURCE	CERTAINTY	OBS_METHOD	OBS_TYPE	COUNT	LOCALITY	SITE
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1986	TFAUNA	Certain	Survey	Caught or trapped	15	Lake Douglas	Lake Douglas, 12 km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1986	TFAUNA	Certain	Survey	Caught or trapped	4	Lake Douglas	Lake Douglas, 12 km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1991	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas, Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1987	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1987	TFAUNA	Certain	Survey	Caught or trapped	8	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1987	TFAUNA	Certain	Survey	Caught or trapped	2	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1989	TFAUNA	Certain	Survey	Caught or trapped	2	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1989	TFAUNA	Certain	Survey	Caught or trapped	2	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1989	TFAUNA	Certain	Survey	Caught or trapped	3	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1989	TFAUNA	Certain	Survey	Caught or trapped	6	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1991	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1991	TFAUNA	Certain	Survey	Caught or trapped	4	Lake Douglas	Lake Douglas, 12km SW of Kalgoorlie
Leipoa ocellata	malleefowl	BIRD	VU	VU	1985	TFAUNA	Certain	Opportunistic sighting	Sighting	2	Jaurdie Hills	Jaurdie Hills
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1911	TFAUNA	Certain	Historical (written)	Caught or trapped	1	Kalgoorlie	SW Australia, Kalgoorlie District
Jalmenus aridus	inland hairstreak, desert blue butterfly	INVERTEBRATE	P1		1985	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas 12 km SW of Kalgoorlie
Jalmenus aridus	inland hairstreak, desert blue butterfly	INVERTEBRATE	P1		1989	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas 12 km SW of Kalgoorlie
Jalmenus aridus	inland hairstreak, desert blue butterfly	INVERTEBRATE	P1		1986	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas 12 km SW of Kalgoorlie
Jalmenus aridus	inland hairstreak, desert blue butterfly	INVERTEBRATE	P1		1986	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas 12 km SW of Kalgoorlie
Ogyris subterrestris	arid bronze azure butterfly	INVERTEBRATE	CR	CR	1985	TFAUNA	Certain	Survey	Caught or trapped	1	Lake Douglas	Lake Douglas 12 km SW of Kalgoorlie
Leipoa ocellata	malleefowl	BIRD	VU	VU	2006	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Bullabulling	Bullabulling
Leipoa ocellata	malleefowl	BIRD	VU	VU	2007	TFAUNA	Certain	Opportunistic sighting	Day sighting	2	Bullabulling	Bullabulling
Leipoa ocellata	malleefowl	BIRD	VU	VU	2008	TFAUNA	Certain	Opportunistic sighting	Day sighting	2	Bullabulling	Bullabulling pastoral lease, 10km west of the Bullabulling Pub and 2 kms south of the highway
Jalmenus aridus	inland hairstreak, desert blue butterfly	INVERTEBRATE	P1		1997	TFAUNA	Certain	Survey	Caught or trapped	1	Karramindie	Lake Douglas (Douglas Lake)
Leipoa ocellata	malleefowl	BIRD	VU	VU	2009	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Mount Burges	North of Mount Burges
Leipoa ocellata	malleefowl	BIRD	VU	VU	2009	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Bullabulling	Bullabulling, road from Bullabulling to Stewart
Leipoa ocellata	malleefowl	BIRD	VU	VU	2010	TFAUNA	Certain	Opportunistic sighting	Sighting	1		Vic Rock Road
Leipoa ocellata	malleefowl	BIRD	VU	VU	2011	TFAUNA	Certain	Opportunistic sighting	Day sighting	1		Yallari Timber Reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	2011	TFAUNA	Certain	Opportunistic sighting	Secondary sign	0		Yallari Timber Reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	2011	TFAUNA	Certain	Opportunistic sighting	Day sighting	1		
Leipoa ocellata	malleefowl	BIRD	VU	VU	2009	TFAUNA	Certain	Opportunistic sighting	Day sighting	1		on road from Bullabulling to Stuart sighting, off Great Eastern Highway
Leipoa ocellata	malleefowl	BIRD	VU	VU	2009	TFAUNA	Certain	Opportunistic sighting	Day sighting	1		north of Mt Burgess
Leipoa ocellata	malleefowl	BIRD	VU	VU	2011	TFAUNA	Certain	Survey	Caught or trapped	1		gravel area just of side of the raod at Yarri and Bariick Kanowna Belle access road intersection.
Leipoa ocellata	malleefowl	BIRD	VU	VU	2012	TFAUNA	Certain	Opportunistic sighting	Day sighting	2	Coolgardie	Just off cave hill road in Widgiemooltha close to one of Focus Minerals small operations.
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Dead	1	Bullabulling	48km West of Coolgardie, No 8 pump Denardi Station, Great Eastern Highway
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Moderately certain	Opportunistic sighting	Day sighting	1	Bullabulling	~10km east if Bullabulling (40km east of Coolgardie) on Great Eastern Highway
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Moderately certain	Opportunistic sighting	Night sighting	1	Feysville	Out the front of Pevnatty Crib room on active haul road. A higly disturbed area.
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Secondary sign	0	Scahil Timber reserve	Scahil Timber reserve

CLASS	SCI_NAME	COM_NAME	WA_status	EPBCstatus	YEAR	SOURCE	CERTAINTY	OBS_METHOD	OBS_TYPE	COUNT	LOCALITY	SITE
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Burra Rock Conservation Reserve	Carpark at Burra Rock. Mound found within adjacent bush habitat.
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Ora Banda	500m before Cawse Nickel turn off on Broad Arrow-Ora Banda road, heading towards Ora Banda
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Kanowna	~5km before the Mt Pleasant Office turn off on Mt Pleasant Rd, off Menzies Highway
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Dead	1	Kanowna	3.1km north of Paddington Mill (35km north of Kalgoorlie) on Menzies Highway
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Day sighting	1		3.2km east of cawse nickel turn off on the Ora Banda - Broad Arrow Rd
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Moderately certain	Opportunistic sighting	Day sighting	1	Feysville	Woolibar Station, just south of where Woolibar creek crosses the Goldfields Highway.
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Dead	1	Kanowna	~4.45km east of Cawse Nickel turn off on the Broad Arrow- Ora Banda Rd
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Dead	1	Kanowna	~100-200m W of drilling track access road, on the Braod Arrow to Ora Banda road, Near Cawse Nickel turn off.
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Kanowna	~10km W of Menzies Hwy on Ora Banda - Broad Arrow road
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Day sighting	1		3.26km E of Cawse Nickel turn off on Broad Arrow - Ora banda Rd
Leipoa ocellata	malleefowl	BIRD	VU	VU	2014	TFAUNA	Certain	Opportunistic sighting	Day sighting	2	Burra Rock	Burra Rock, Directly west of campsite, south of old east-west track
Leipoa ocellata	malleefowl	BIRD	VU	VU	2015	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Parkeston	100m along a small track - off a major dirt road; approximately 9km NE of Kalgoorlie
Leipoa ocellata	malleefowl	BIRD	VU	VU	2015	TFAUNA	Certain	Opportunistic sighting	Day sighting	2	Bulong	10.6km SSE of Hampton Hill Station homestead
Leipoa ocellata	malleefowl	BIRD	VU	VU	2015	TFAUNA	Certain	Opportunistic sighting	Day sighting	2	Feysville	Brown Hil on Woolubar Station. Kambolda Rd, Boulder WA
Leipoa ocellata	malleefowl	BIRD	VU	VU	2016	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	Coolgardie	Coolgardie North Rd, approx. 5km N of Coolgardie
Leipoa ocellata	malleefowl	BIRD	VU	VU	2016	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	Coolgardie	Coolgardie North Rd, approx. 7km N of Coolgardie, near Bonnievale
Leipoa ocellata	malleefowl	BIRD	VU	VU	2015	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	Coolgardie	Between Burra Rocks Rd and Coolgardie-Esperance Rd, approx. 5km S of Coolgardie
Leipoa ocellata	malleefowl	BIRD	VU	VU	2016	TFAUNA	Certain	Opportunistic sighting	Dusk sighting	1	Yallari Timber Reserve	Yallari Timber Reserve, central N-S track
Leipoa ocellata	malleefowl	BIRD	VU	VU	2016	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	Mount Burges	Traveling route back from Lake Carnage (Coolgardie Nth Rd??), 10km S of Ora Banda
Leipoa ocellata	malleefowl	BIRD	VU	VU	1996	TFAUNA	Moderately certain	Opportunistic sighting	Secondary sign	0	Coolgardie	4WD Holland Track, 200km NE of Mt Holland (cannot find Holland Track)
Leipoa ocellata	malleefowl	BIRD	VU	VU	1965	TFAUNA	Moderately certain	Historical (written)	Secondary sign	0	MOUNT BURGES	12 miles North of Coolgardie
Leipoa ocellata	malleefowl	BIRD	VU	VU	1994	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	2	BULLABULLING	22 kms west of Coolgardie
Leipoa ocellata	malleefowl	BIRD	VU	VU	2004	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	KANOWNA	50 km nth of kalgoorlie on main hwy nth of Mt Vetters homestead
Leipoa ocellata	malleefowl	BIRD	VU	VU	1902	TFAUNA	Moderately certain	Opportunistic sighting	Secondary sign	0	BOORARA	Boorara
Leipoa ocellata	malleefowl	BIRD	VU	VU	2001	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	BULONG	Corsair Mine 10km E of Kalgoorlie; 1km S of Bulong Rd on graded track heading E
Leipoa ocellata	malleefowl	BIRD	VU	VU	1988	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	MOUNT BURGES	Eight Mile Rock dam
Leipoa ocellata	malleefowl	BIRD	VU	VU	2002	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	2	KARRAMINDIE	grt eastern hway 1 km kal side of mungarrie industrial area
Leipoa ocellata	malleefowl	BIRD	VU	VU	2002	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	2	BULONG	Hampton Hill Station, 16km ESE of Boulder b/w Boorara Mine Site & Golden Ridge
Leipoa ocellata	malleefowl	BIRD	VU	VU	1910	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	LAMINGTON	Kalgoorlie
Leipoa ocellata	malleefowl	BIRD	VU	VU	1991	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	BULLABULLING	Kangaroo Hills Timber Reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	1947	TFAUNA	Moderately certain	Opportunistic sighting	Secondary sign	0	LAMINGTON	PO Kalgoorlie
Leipoa ocellata	malleefowl	BIRD	VU	VU	1988	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	MOUNT BURGES	WMC sand pit Jaurdi Hills Rd
Leipoa ocellata	malleefowl	BIRD	VU	VU	1995	TFAUNA	Moderately certain	Opportunistic sighting	Sighting	1	LONDONDERRY	Yallari Timber Reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	1995	TFAUNA	Moderately certain	Opportunistic sighting	Day sighting	1	LONDONDERRY	Yerilla Sandalwood Reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	2017	TFAUNA	Very Certain (photo, spec	Opportunistic sighting	Day sighting	1	Goldfields Woodlands Conservation P	5km N of Victoria Rock, on Coolgardie Vic Rock Rd, in Goldfields Woodlands CP

CLASS	SCI_NAME	COM_NAME	WA_status	EPBCstatus	YEAR	SOURCE	CERTAINTY	OBS_METHOD	OBS_TYPE	COUNT	LOCALITY	SITE
Leipoa ocellata	malleefowl	BIRD	VU	VU	2017	TFAUNA	Very Certain (photo, spec	Monitoring	Remote camera	1	Londonderry	Scahill Rimber Reserve, on track south of reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	2017	TFAUNA	Very Certain (photo, spec	Monitoring	Remote camera	1	Londonderry	Scahill Rimber Reserve, on track south of reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	2018	TFAUNA	Very Certain (photo, spec	Opportunistic sighting	Dawn sighting	2	Kanowna	Borad Arrow-Ora Banda Rd, 3km E of Cawse Nickel turnoff
Leipoa ocellata	malleefowl	BIRD	VU	VU	2018	TFAUNA	Not sure	Opportunistic sighting	Sighting	1	Ora Banda	Norton Gold field mining lease road
Leipoa ocellata	malleefowl	BIRD	VU	VU	2017	TFAUNA	Moderately certain	Opportunistic sighting	Day sighting	1	Karramindie	Karramindie State Forest No. 8
Leipoa ocellata	malleefowl	BIRD	VU	VU	2017	TFAUNA	Very Certain (photo, spec	Opportunistic sighting	Dusk sighting	1	Karramindie	50m E of the S/W corner gate of Karramindie State Forest, where the gully crosses the track
Leipoa ocellata	malleefowl	BIRD	VU	VU	2018	TFAUNA	Very Certain (photo, spec	Opportunistic sighting	Secondary sign	0	Karramindie	1.7km S of Karramindie State Forest on Hampton Location 53
Leipoa ocellata	malleefowl	BIRD	VU	VU	2018	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Londonberry	Old woodline track running SW away from Scahill Timber Reserve
Leipoa ocellata	malleefowl	BIRD	VU	VU	2018	TFAUNA	Very Certain (photo, spec	Monitoring	Remote camera	2	Londonderry	3.5km S of Scahill Timber Reserve, Londonderry
Leipoa ocellata	malleefowl	BIRD	VU	VU	2018	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	Kanowna	Golden cities Mine Site haul road, Kanowna
Calyptorhynchus lati	Carnaby's cockatoo	BIRD	EN	EN	2018	TFAUNA	Very Certain (photo, spec	Opportunistic sighting	Day sighting	1	Sommerville	Southern corner of Hay St and Hutton St
Leipoa ocellata	malleefowl	BIRD	VU	VU	2018	TFAUNA	Very Certain (photo, spec	Opportunistic sighting	Day sighting	0	Kalgoorlie	West norh-west of Kalgoorlie about 20km
Leipoa ocellata	malleefowl	BIRD	VU	VU	2018	TFAUNA	Certain	Opportunistic sighting	Day sighting	2	Golden Cities	Goldfields mining tenure
Leipoa ocellata	malleefowl	BIRD	VU	VU	2007	TFAUNA	Certain	Opportunistic sighting		1	Coolgardie	Victoria Rock Rd, about 15km south of Coolgardie
Leipoa ocellata	malleefowl	BIRD	VU	VU	2007	TFAUNA	Certain	Opportunistic sighting		1	Kalgoorlie	Broad Arrow-Ora Banda Rd, few km east of Cawse Mine turnoff
Leipoa ocellata	malleefowl	BIRD	VU	VU	2007	TFAUNA	Certain	Opportunistic sighting		1	Coolgardie	Burra Rock Road, 11.2km north of DEC Burra Rock Reserve boundary sign
Leipoa ocellata	malleefowl	BIRD	VU	VU	2012	TFAUNA	Certain	Opportunistic sighting		4	Coolgardie	Borefields on Focus owned mine lease, near bore 8
Leipoa ocellata	malleefowl	BIRD	VU	VU	2008	TFAUNA	Certain	Opportunistic sighting		1	Kambalda	
Leipoa ocellata	malleefowl	BIRD	VU	VU	2006	TFAUNA	Certain	Opportunistic sighting		1	Coolgardie	23.2km south of T intersection of Coolgardie Norseman Rd
Leipoa ocellata	malleefowl	BIRD	VU	VU	2008	TFAUNA	Certain	Opportunistic sighting	Dusk sighting	1	Coolgardie	Great Eastern Hwy, 40.5km west of Coolgardie
Leipoa ocellata	malleefowl	BIRD	VU	VU	2009	TFAUNA	Certain	Opportunistic sighting		2	Coolgardie	Juardi Hills Rd, 100m north of crest
Leipoa ocellata	malleefowl	BIRD	VU	VU	2009	TFAUNA	Certain	Opportunistic sighting		1	Londonerry	about 3km south of Burra Rock Reserve along Burra Rock Road
Leipoa ocellata	malleefowl	BIRD	VU	VU	2010	TFAUNA	Certain	Opportunistic sighting		1	Londonberry	Burra Rock Nature Reserve, next to camping area
Leipoa ocellata	malleefowl	BIRD	VU	VU	2010	TFAUNA	Certain	Opportunistic sighting		1	Kambalda	5km along pipeline access road off Cave Rocks mine haul rd
Leipoa ocellata	malleefowl	BIRD	VU	VU	2010	TFAUNA	Certain	Opportunistic sighting	Dead	1	Kambalda	9km N of Kambalda T intersection along Goldfields Hwy
Leipoa ocellata	malleefowl	BIRD	VU	VU	2010	TFAUNA	Certain	Opportunistic sighting		1	Bullabulling	Great Eastern Hwy, 130km E of Southern Cross, near unnamed gravel road
Leipoa ocellata	malleefowl	BIRD	VU	VU	2011	TFAUNA	Certain	Opportunistic sighting		1	Ora Banda	Broad Arrow-Ora Banda Rd, approx. 5.5km from Norilsk Nickel access road toward east
Leipoa ocellata	malleefowl	BIRD	VU	VU	2011	TFAUNA	Certain	Opportunistic sighting		2	Londonderry	Burra Rock camping ground
Leipoa ocellata	malleefowl	BIRD	VU	VU	2011	TFAUNA	Certain	Survey		0	Ora Banda	
Leipoa ocellata	malleefowl	BIRD	VU	VU	2011	TFAUNA	Certain	Survey		0	Ora Banda	
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Sighting	1	Coolgardie	7km south of Coolgardie on the Victoria Rock Road
Leipoa ocellata	malleefowl	BIRD	VU	VU	0	TFAUNA	Certain	Opportunistic sighting	Secondary sign	0	Burra Rock Conservation Reserve	
Leipoa ocellata	malleefowl	BIRD	VU	VU	2012	TFAUNA	Certain	Opportunistic sighting	Sighting	1	Kalgoorlie	Goldfield HWY
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Sighting	1	Ora Banda	Between Broad Arrow and Ora Banda
Leipoa ocellata	malleefowl	BIRD	VU	VU	2013	TFAUNA	Certain	Opportunistic sighting	Sighting	1	Goldfields- Kalgoorlie/Coolgardie	Great Eastern Highway
Leipoa ocellata	malleefowl	BIRD	VU	VU	2019	TFAUNA	Certain	Opportunistic sighting	Dusk sighting	1	Arrow Lake	
Leipoa ocellata	malleefowl	BIRD	VU	VU	2019	TFAUNA	Certain	Opportunistic sighting	Sighting	1	Mungari	Mungari turnoff from Great Eastern HWY heading South
Leipoa ocellata	Malleefowl	BIRD	VU	VU	0	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	KALGOORLIE	Kalgoorlie
Leipoa ocellata	Malleefowl	BIRD	VU	VU	0	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1		Kalgoorlie

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 02/11/2021

Kingdom Animalia
Current Names Only Yes
Core Datasets Only Yes
Species Group All Animals
Method 'By Circle'
Centre 121° 11' 12" E,30° 55' 14" S
Buffer 40km
Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	297	4751
Priority 1	1	5
Priority 4	1	1
Protected under international agreement	6	13
Rare or likely to become extinct	6	67
TOTAL	**311**	**4837**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Rare or likely to become extinct					
1.	24784	*Calidris ferruginea (Curlew Sandpiper)*		T	
2.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)*		T	
3.	24557	*Leipoa ocellata (Malleefowl)*		T	
4.	24168	*Macrotis lagotis (Bilby, Dalgyte, Ninu)*		T	
5.	24146	*Myrmecobius fasciatus (Numbat, Walpurti)*		T	
6.	33987	*Ogyris subterrestris subsp. petrina (Arid Bronze Azure Butterfly)*		T	
Protected under international agreement					
7.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
8.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
9.	24780	*Calidris alba (Sanderling)*		IA	
10.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	
11.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
12.	24808	*Tringa nebularia (Common Greenshank, greenshank)*		IA	
Priority 1					
13.	33979	*Jalmenus aridus (inland hairstreak, desert blue butterfly)*		P1	Y
Priority 4					
14.	24803	*Tringa brevipes (Grey-tailed Tattler)*		P4	
Non-conservation taxon					
15.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
16.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
17.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
18.	24265	*Acanthiza uropygialis (Chestnut-rumped Thornbill)*			
19.	25243	*Acanthophis pyrrhus (Desert Death Adder)*			
20.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
21.	25536	*Accipiter fasciatus (Brown Goshawk)*			
22.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
23.		*Afraflacilla stridulator*			
24.		*Afrosternophorus hirsti*			Y
25.		*Allodessus bistrigatus*			
26.		*Aname armigera*			
27.		*Aname mainae*			
28.	24312	*Anas gracilis (Grey Teal)*			
29.	24313	*Anas platyrhynchos (Mallard)*			
30.	24315	*Anas rhynchotis (Australasian Shoveler)*			
31.	24316	*Anas superciliosa (Pacific Black Duck)*			
32.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
33.		*Anidiops villosus*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
34.	24561	*Anthochaera carunculata (Red Wattlebird)*			
35.	25670	*Anthus australis (Australian Pipit)*			
36.	24599	*Anthus australis subsp. australis (Australian Pipit)*			
37.	25528	*Aphelocephala leucopsis (Southern Whiteface)*			
38.	24266	*Aphelocephala leucopsis subsp. castaneiventris (Southern Whiteface)*			
39.	24285	*Aquila audax (Wedge-tailed Eagle)*			
40.	41324	*Ardea modesta (great egret, white egret)*			
41.	24341	*Ardea pacifica (White-necked Heron)*			
42.	24610	*Ardeotis australis (Australian Bustard)*			
43.		*Argiope protensa*			
44.		*Argiope trifasciata*			
45.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
46.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
47.	24356	*Artamus personatus (Masked Woodswallow)*			
48.		*Austracantha minax*			
49.	24318	*Aythya australis (Hardhead)*			
50.		*Backobourkia heroine*			
51.		*Baiami tegenarioides*			
52.		*Barnardius zonarius*			
53.		*Berosus nutans*			
54.	24319	*Biziura lobata (Musk Duck)*			
55.	42380	*Brachyurophis fasciolatus subsp. fasciolatus (Narrow-banded Shovel-nosed Snake)*			
56.	42381	*Brachyurophis semifasciatus (Southern Shovel-nosed Snake)*			
57.	25715	*Cacatua roseicapilla (Galah)*			
58.	25716	*Cacatua sanguinea (Little Corella)*			
59.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
60.	24253	*Capra hircus (Goat)*	Y		
61.		*Carassius auratus*			
62.		*Celaenia excavata*			
63.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
64.		*Cercophonius michaelseni*			
65.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
66.	24187	*Chalinolobus morio (Chocolate Wattled Bat)*			
67.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
68.	43380	*Chelodina colliei (South-western Snake-necked Turtle)*			
69.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
70.	47909	*Cheramoeca leucosterna (White-backed Swallow)*			
71.		*Chroicocephalus novaehollandiae*			
72.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
73.	24434	*Chrysococcyx osculans (Black-eared Cuckoo)*			
74.	24289	*Circus assimilis (Spotted Harrier)*			
75.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
76.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
77.	24399	*Columba livia (Domestic Pigeon)*	Y		
78.	24361	*Coracina maxima (Ground Cuckoo-shrike)*			
79.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
80.		*Corasoides australis*			
81.		*Corimaethes campestrus*			
82.		*Cormocephalus bungalbinensis*			
83.	24416	*Corvus bennetti (Little Crow)*			
84.	25592	*Corvus coronoides (Australian Raven)*			
85.	25593	*Corvus orru (Torresian Crow)*			
86.	24671	*Coturnix pectoralis (Stubble Quail)*			
87.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
88.	25595	*Cracticus tibicen (Australian Magpie)*			
89.	25596	*Cracticus torquatus (Grey Butcherbird)*			
90.	30893	*Cryptoblepharus buchananii*			
91.	25020	*Cryptoblepharus plagiocephalus*			
92.	25458	*Ctenophorus caudicinctus (Ring-tailed Dragon)*			
93.	24871	*Ctenophorus cristatus (Bicycle Dragon)*			
94.	24873	*Ctenophorus fordi (Mallee Sand Dragon)*			
95.	24874	*Ctenophorus isolepis subsp. citrinus (Yellowy Military Dragon)*			
96.	24882	*Ctenophorus nuchalis (Central Netted Dragon)*			
97.	24886	*Ctenophorus reticulatus (Western Netted Dragon)*			
98.	24888	*Ctenophorus salinarum (Salt Pan Dragon)*			
99.	24889	*Ctenophorus scutulatus (Lozenge-marked Dragon)*			
100.	25026	*Ctenotus atlas*			
101.	25052	*Ctenotus leonhardii*			
102.	25074	*Ctenotus schomburgkii*			
103.	25465	*Ctenotus uber (Spotted Ctenotus)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
104.	25080	*Ctenotus uber subsp. uber (Spotted Ctenotus)*			
105.	25089	*Cyclodomorphus melanops subsp. elongatus (Slender Blue-tongue)*			
106.	24322	*Cygnus atratus (Black Swan)*			
107.		*Cyrtophora parnasia*			
108.		*Daphnia carinata*			
109.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
110.	24606	*Daphoenositta chrysoptera subsp. pileata (Varied Sittella, Black-capped Sitella)*			
111.	24995	*Delma australis*			
112.	25247	*Demansia psammophis subsp. psammophis (Yellow-faced Whipsnake)*			
113.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
114.	25469	*Diplodactylus granariensis*			
115.	24929	*Diplodactylus granariensis subsp. granariensis*			
116.	24940	*Diplodactylus pulcher*			
117.	24470	*Dromaius novaehollandiae (Emu)*			
118.	24650	*Drymodes brunneopygia (Southern Scrub-robin)*			
119.	25092	*Egernia depressa (Southern Pygmy Spiny-tailed Skink)*			
120.	25094	*Egernia formosa*			
121.	25104	*Egernia richardi*			
122.		*Egretta novaehollandiae*			
123.		*Elanus axillaris*			
124.	24290	*Elanus caeruleus subsp. axillaris (Australian Black-shouldered Kite)*			
125.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
126.		*Enochrus elongatulus*			
127.		*Eolophus roseicapillus*			
128.	24651	*Eopsaltria australis subsp. griseogularis (Western Yellow Robin)*			
129.	24567	*Epthianura albifrons (White-fronted Chat)*			
130.	24570	*Epthianura tricolor (Crimson Chat)*			
131.	25109	*Eremiascincus richardsonii (Broad-banded Sand Swimmer)*			
132.		*Eriophora biapicata*			
133.	24379	*Erythrogonys cinctus (Red-kneed Dotterel)*			
134.	24368	*Eurostopodus argus (Spotted Nightjar)*			
135.	25621	*Falco berigora (Brown Falcon)*			
136.	24471	*Falco berigora subsp. berigora (Brown Falcon)*			
137.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
138.	25623	*Falco longipennis (Australian Hobby)*			
139.	24041	*Felis catus (Cat)*	Y		
140.		*Fissarena castanea*			
141.	25727	*Fulica atra (Eurasian Coot)*			
142.	25301	*Furina ornata (Moon Snake)*			
143.	24957	*Gehyra purpurascens*			
144.	24959	*Gehyra variegata*			
145.	25530	*Gerygone fusca (Western Gerygone)*			
146.	24443	*Grallina cyanoleuca (Magpie-lark)*			
147.	24295	*Haliastur sphenurus (Whistling Kite)*			
148.		*Hemicloea sublimbata*			
149.	25232	*Hemidactylus frenatus (Asian House Gecko)*	Y		
150.	25115	*Hemiergis initialis subsp. initialis*			
151.	42408	*Hesperoedura reticulata*			
152.	24961	*Heteronotia binoei (Bynoe's Gecko)*			
153.	47965	*Hieraaetus morphnoides (Little Eagle)*			
154.	25734	*Himantopus himantopus (Black-winged Stilt)*			
155.	24775	*Himantopus himantopus subsp. leucocephalus (Black-winged Stilt)*			
156.	24491	*Hirundo neoxena (Welcome Swallow)*			
157.		*Hoggicosa castanea*			
158.		*Hoggicosa forresti*			
159.		*Holoplatys kalgoorlie*			Y
160.		*Holoplatys planissima*			
161.	34001	*Hylacola cauta subsp. whitlocki (Shy Groundwren)*			
162.		*Idiommata blackwalli*			
163.		*Isometroides vescus*			
164.		*Isopeda magna*			
165.		*Isopedella saundersi*			
166.		*Jalmenus icilius*			Y
167.	24367	*Lalage tricolor (White-winged Triller)*			
168.		*Lampona cylindrata*			
169.		*Lamponina scutata*			
170.		*Latrodectus hasseltii*			
171.		*Lerista kingi*			
172.	25155	*Lerista muelleri*			
173.	25162	*Lerista picturata*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
174.	25172	*Lerista stictopleura*			
175.	42411	*Lerista timida*			
176.	25005	*Lialis burtonis*			
177.	25659	*Lichenostomus leucotis (White-eared Honeyeater)*			
178.	24576	*Lichenostomus leucotis subsp. novaenorciae (White-eared Honeyeater)*			
179.	25661	*Lichmera indistincta (Brown Honeyeater)*			
180.	41411	*Liopholis inornata (Desert Skink)*			
181.	25388	*Litoria moorei (Motorbike Frog)*			
182.	30935	*Lucasium maini*			
183.		*Lycosa ariadnae*			
184.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
185.	24136	*Macropus rufus (Red Kangaroo, Marlu)*			
186.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
187.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
188.	24551	*Malurus pulcherrimus (Blue-breasted Fairy-wren)*			
189.	25654	*Malurus splendens (Splendid Fairy-wren)*			
190.	24583	*Manorina flavigula (Yellow-throated Miner)*			
191.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
192.	24736	*Melopsittacus undulatus (Budgerigar)*			
193.	25184	*Menetia greyii*			
194.	24598	*Merops ornatus (Rainbow Bee-eater)*			
195.		*Microcarbo melanoleucos*			
196.	25693	*Microeca fascinans (Jacky Winter)*			
197.	24654	*Microeca fascinans subsp. assimilis (Jacky Winter)*			
198.		*Missulena occatoria*			
199.	24904	*Moloch horridus (Thorny Devil)*			
200.	25240	*Morelia spilota subsp. imbricata (Carpet Python)*			
201.	25188	*Morethia adelaidensis*			
202.	25190	*Morethia butleri*			
203.	24223	*Mus musculus (House Mouse)*	Y		
204.	25248	*Neelaps bimaculatus (Black-naped Snake)*			
205.	25425	*Neobatrachus kunapalari (Kunapalari Frog)*			
206.	25426	*Neobatrachus pelobatoides (Humming Frog)*			
207.	25427	*Neobatrachus sutor (Shoemaker Frog)*			
208.	25428	*Neobatrachus wilsmorei (Plonking Frog)*			
209.		*Nephila edulis*			
210.	24971	*Nephrurus vertebralis*			
211.		*Nicodamus mainae*			
212.	24096	*Ningaui yvonneae (Southern Ningaui)*			
213.	24229	*Notomys mitchellii (Mitchell's Hopping-mouse)*			
214.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
215.	24742	*Nymphicus hollandicus (Cockatiel)*			
216.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
217.	24618	*Oreoica gutturalis (Crested Bellbird)*			
218.	34011	*Oreoica gutturalis subsp. gutturalis (Crested Bellbird (southern))*			
219.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
220.		*Ostracoda (unident.)*			
221.		*Oxyopes amoenus*			
222.		*Oxyopes dingo*			
223.		*Oxyopes variabilis*			
224.		*Ozestheria packardi*			
225.	24619	*Pachycephala inornata (Gilbert's Whistler)*			
226.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
227.		*Parartemia sp.*			
228.	25253	*Parasuta gouldii*			
229.	25254	*Parasuta monachus*			
230.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
231.	25682	*Pardalotus striatus (Striated Pardalote)*			
232.	24630	*Pardalotus striatus subsp. westraliensis (Striated Pardalote)*			
233.	48060	*Petrochelidon ariel (Fairy Martin)*			
234.	48061	*Petrochelidon nigricans (Tree Martin)*			
235.	24659	*Petroica goodenovii (Red-capped Robin)*			
236.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
237.	24409	*Phaps chalcoptera (Common Bronzewing)*			
238.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
239.	25720	*Platycercus icterotis (Western Rosella)*			
240.	24748	*Platycercus varius (Mulga Parrot)*			
241.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
242.	24751	*Platycercus zonarius subsp. zonarius (Port Lincoln Parrot)*			
243.	25703	*Podargus strigoides (Tawny Frogmouth)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
244.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
245.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
246.	30854	*Polytelis anthopeplus subsp. westralis (Regent Parrot)*			
247.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
248.	34013	*Pomatostomus superciliosus subsp. ashbyi (White-browed Babbler (western wheatbelt))*			
249.	24769	*Porzana fluminea (Australian Spotted Crake)*			
250.	25261	*Pseudechis australis (Mulga Snake)*			
251.	24232	*Pseudomys bolami (Bolam's Mouse)*			
252.	24237	*Pseudomys hermannsburgensis (Sandy Inland Mouse)*			
253.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
254.	25263	*Pseudonaja modesta (Ringed Brown Snake)*			
255.	25434	*Pseudophryne occidentalis (Western Toadlet)*			
256.	42344	*Purnella albifrons (White-fronted Honeyeater)*			
257.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
258.	25009	*Pygopus nigriceps*			
259.	24278	*Pyrrholaemus brunneus (Redthroat)*			
260.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
261.	48096	*Rhipidura albiscapa (Grey Fantail)*			
262.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
263.	24982	*Rhynchoedura ornata (Western Beaked Gecko)*			
264.		*Sandalodes scopifer*			
265.		*Scolopendra laeta*			
266.		*Scolopendra morsitans*			
267.	24199	*Scotorepens balstoni (Inland Broad-nosed Bat)*			
268.		*Selenotholus foelschei*			
269.	25266	*Simoselaps bertholdi (Jan's Banded Snake)*			
270.	30948	*Smicrornis brevirostris (Weebill)*			
271.	24108	*Sminthopsis crassicaudata (Fat-tailed Dunnart)*			
272.	24109	*Sminthopsis dolichura (Little long-tailed Dunnart)*			
273.	24111	*Sminthopsis gilberti (Gilbert's Dunnart)*			
274.	24329	*Stictonetta naevosa (Freckled Duck)*			
275.		*Storena sinuosa*			
276.	25597	*Strepera versicolor (Grey Currawong)*			
277.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
278.	24923	*Strophurus assimilis (Goldfields Spiny-tailed Gecko)*			
279.	24927	*Strophurus elderi*			
280.	25269	*Suta fasciata (Rosen's Snake)*			
281.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
282.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
283.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
284.	30870	*Taeniopygia guttata (Zebra Finch)*			
285.		*Tamopsis circumvidens*			
286.	24176	*Taphozous hilli (Hill's Sheathtail-bat)*			
287.		*Tasmanicosa leuckartii*			
288.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
289.	25203	*Tiliqua occipitalis (Western Bluetongue)*			
290.	25519	*Tiliqua rugosa*			
291.	25207	*Tiliqua rugosa subsp. rugosa*			
292.	42351	*Todiramphus pyrrhopygius (Red-backed Kingfisher)*			
293.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
294.	48141	*Tribonyx ventralis (Black-tailed Native-hen)*			
295.		*Trichocyclus balladong*			
296.	39407	*Triops australiensis (Shield Shrimp)*			
297.	24851	*Turnix velox (Little Button-quail)*			
298.	30814	*Tympanocryptis cephalus (Pebble Dragon)*			
299.	39408	*Tympanocryptis lineata (Lined Earless Dragon)*			
300.	24852	*Tyto alba subsp. delicatula (Barn Owl)*			
301.	24983	*Underwoodisaurus milii (Barking Gecko)*			
302.		*Urodacus armatus*			
303.		*Urodacus hoplurus*			
304.		*Urodacus yaschenkoi*			
305.	24386	*Vanellus tricolor (Banded Lapwing)*			
306.	25211	*Varanus caudolineatus*			
307.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
308.	25526	*Varanus tristis (Racehorse Monitor)*			
309.	24202	*Vespadelus baverstocki (Inland Forest Bat)*			
310.	24206	*Vespadelus regulus (Southern Forest Bat)*			
311.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			

Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

Australian Government

Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

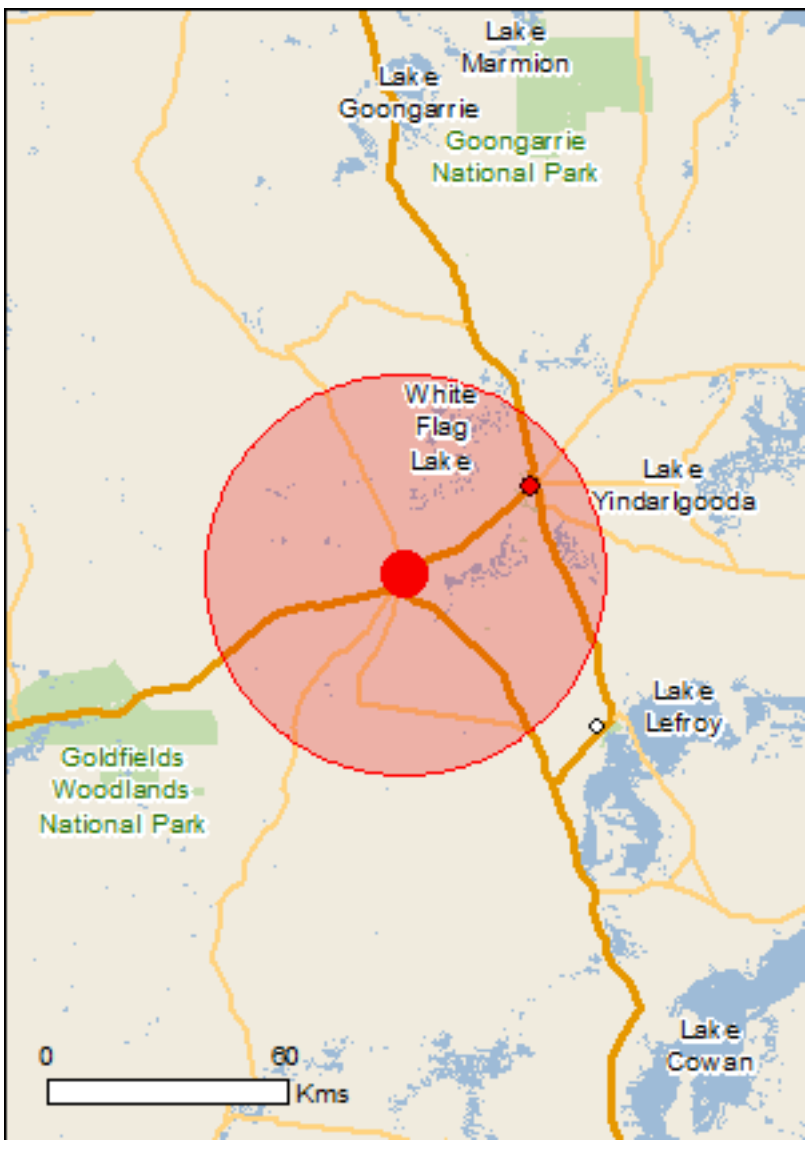
This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 25/10/21 19:14:20

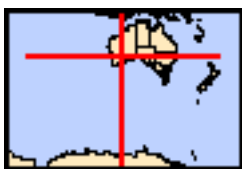
Summary
Details
Matters of NES
Other Matters Protected by the EPBC Act
Extra Information
Caveat
Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

Coordinates

Buffer: 50.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	8
Listed Migratory Species:	7

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	4
Commonwealth Heritage Places:	None
Listed Marine Species:	11
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	9
Regional Forest Agreements:	None
Invasive Species:	16
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

National Heritage Properties		[Resource Information]
Name	State	Status
Historic		
Goldfields Water Supply Scheme, Western Australia	WA	Listed place

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Insects		
Ogyris subterrestris petrina Arid Bronze Azure [77743]	Critically Endangered	Species or species habitat may occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area
Plants		
Gastrolobium graniticum Granite Poison [14872]	Endangered	Species or species habitat known to occur within area
Thelymitra stellata Star Sun-orchid [7060]	Endangered	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		

Name	Threatened	Type of Presence
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -
Defence - AIRTC KALGOORLIE
Defence - KALGOORLIE RIFLE RANGE
Defence - KALGOORLIE TRAINING DEPOT

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area
[Ardea ibis](#) Cattle Egret [59542]		Species or species habitat may occur within area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area
[Chrysococcyx osculans](#) Black-eared Cuckoo [705]		Species or species

Name	Threatened	Type of Presence
		habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Goldfields Woodlands	WA
Kalgoorlie Arboretum	WA
Kambalda	WA
Kangaroo Hills Timber Reserve	WA
Kurrawang	WA
Lakeside Timber Reserve	WA
Scahill Timber Reserve	WA
Victoria Rock	WA
Yallari Timber Reserve	WA

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Equus asinus Donkey, Ass [4]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Carrichtera annua Ward's Weed [9511]		Species or species habitat likely to occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Cylindropuntia spp. Prickly Pears [85131]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-30.92058 121.18644

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Appendix C
Coolgardie Flora Likelihood Table

Appendix: Assessment of the Likelihood of Occurrence of Threatened and Priority Flora as per Desktop Assessment Database Searches surrounding the Survey Area

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2021 DBCA database. High = Suitable habitat present and records less than 15 km from the Survey Area, Medium = Suitable habitat present and records between 15 km and 30 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 30 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing. 1: Department of the Environment (2021). SPRAT EPBC Threatened Flora in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. 2: Department of Biodiversity, Conservation and Attractions (2021). FloraBase - TheWestern Australian Flora. https://florabase.dpaw.wa.gov.au/

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Gastrolobium graniticum	T	EN	X	X	X	25.8	Aug to Sep.	Sand, sandy loam, granite. Margins of rock outcrops, along drainage lines.[2]	No	Medium	Low
Tetratheca spenceri	T				X	39.1	Mar	Gentle slope on duricrust breakaway.[2]	No	Low	Low
Thelymitra stellata	T	EN		X		12.8	Oct - Nov	Grows on ridges and slopes, flats, also on riverbanks and breakaways. Soil types are red, brown, yellow, or grey sandy loams clay or gravel over laterite or gravel. Dry, moist or saline conditions are tolerated.[1]	Yes	High	Medium
Acacia coatesii	P1		X			7.4	Sep	Flat to gentle slope, red sandy loam soils. [2]	Yes	High	Medium
Acacia epedunculata	P1				X	18.6	Aug - Oct	Yellow sand. Sandplains.[2]	Yes	Medium	Low
Acacia sclerophylla var. teretiuscula	P1		X			16.1	Sep - Oct	Clay and loamy soils.[2]	Yes	Medium	Low
Acacia websteri	P1		X		X	0.7	Jun	Red sand, clay or loam. Low-lying areas, flats.[2]	Yes	High	High
Calandrinia lefroyensis	P1				X	10.8	Feb or Apr or Oct - Nov	Light brown, orange or red sand, sandy loam, sandy clay loam over sediments. Fine quartz. Gentle slopes, near salt lakes or salt flats, sand dunes.[2]	Yes	High	Medium
Chamelaucium sp. Parker Range (B.H. Smith 1255)	P1				X	19	Nov or Dec	Sandplains, Mid slope. Dry, yellow sand over laterite.[2]	Yes	Medium	Low
Eremophila xantholaema	P1				X	17.7	Sep - Oct	Hilltop and slopes. Brown/orange/red very rocky loam/granite.[2]	Yes	Medium	Low
Cyathostemon divaricatus	P1				X	40.5	Jan or Jun or Aug	Hills, hillslope.[2]	Yes	Low	Low
Dampiera plumosa	P1		X			4.5	Oct	Red sandy soils.[2]	Yes	High	Medium
Eucalyptus websteriana subsp. norsemanica	P1		X			8.7	Sep to Nov	Rocky rises.[2]	Yes	High	Medium
Lepidosperma lyonsii	P1				X	70.6	Jun	Orange skeletal sandy loam with banded ironstone gravel and rock, well-drained shallow stony loam with quartz. Gentle hill slopes, upper slopes of large hill.[2]	Yes	Low	Low
Lepidosperma sp. Parker Range (N. Gibson & M. Lyons 2094)	P1		X			8.3	NA	Brown sandy loam, or clay. Gravel, laterite. Banded ironstone formations, ridges, mid-slopes.[2]	Yes	High	Medium

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Melichrus sp. Coolgardie (K.R. Newbey 8698)	P1				X	24.8	April or Jun or Aug - Dec	Yellow loamy sand. Sandplains.[2]	Yes	Medium	Low
Phebalium appressum	P1		X			7.8	Jul	Yellow sandplain.[2]	Yes	High	Low
Philotheca apiculata	P1				X	45.8	Aug - Nov	Stony clay loam. Rocky outcrops, hillsides.[2]	Yes	Low	Low
Philotheca pachyphylla	P1				X	31.9	May or Sep	Sand, red loam, clay loam. Sandplains, hill tops.[2]	Yes	Low	Low
Prostanthera splendens	P1				X	66.8	Aug - Oct	Stony loam, shallow soils with ironstone pebbles. Breakaways.[2]	No	Low	Low
Pterostylis xerampelina	P1				X	66.1	Sept - Oct	Granite.[2]	Yes	Low	Low
Ptilotus procumbens	P1				X	30.2	Nov	Red clay.[2]	Yes	Low	Low
Ptilotus rigidus	P1				X	30.4	Mar or May or Oct - Jan	Clay, clay loam on quartz hills and edges of salt lakes. [2]	Yes	Low	Low
Ptilotus sp. Kalgoorlie (J. Jackson & B. Moyle 260)	P1				X	36.1	NA	Quartz hills.[2]	Yes	Low	Low
Rhodanthe uniflora	P1				X	44.8	Aug - Oct	Brown earth. Open *Eucalyptus* woodland.[2]	Yes	Low	Low
Ricinocarpos digynus	P1				X	50.4	Aug	Red-brown sand-loam. Rocky hillslopes and plains.[2]	Yes	Low	Low
Tecticornia flabelliformis	P1	VU		X	X	54.8	Dec	Clay. Saline flats.[2]	Yes	Low	Low
Tecticornia mellarium	P1				X	58.4	NA	Close proximity to salt lakes and dunes.[2]	Yes	Low	Low
Thryptomene planiflora	P1		X			19.1	Jul or Aug - Sep	Brown, yellow or orange sandy loam. Lateritic gravel. Gentle hillslopes, sandplains, slight depressions.[2]	Yes	Medium	Medium
Thryptomene sp. Coolgardie (E. Kelso s.n. 1902)	P1		X			2.2	NA	NA	Unknown	Unknown	Medium
Acacia kerryana	P2				X	39.2	Oct - Dec or Jan - Feb	Granitic loamy sand, stony clayey loam or clayey sand. Low stony ridges, undulating plains.[2]	Yes	Low	Low
Austrostipa frankliniae	P2		X			8.5	Oct - Nov	Flat plain, Basalt slope. Dry brown / red loam.[2]	Yes	High	Medium
Bossiaea laxa	P2				X	43.3	May	Brown loam over deep granite. Sheltered positions around outcrops.[2]	No	Low	Low

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Elachanthus pusillus	P2				X	32.1	Aug - Oct	Dry brown or red-orange loam clay. Quartz, limestone, granite. Low plains, drainage flats, gentle upper slopes.[2]	Yes	Low	Low
Eremophila praecox	P2		X		X	17.2	Oct or Dec.	Red/brown sandy loam. Undulating plains.[2]	Yes	Medium	Low
Eucalyptus educta	P2				X	29.7	Apr	Shallow soils. Granite rocks.[2]	Yes	Medium	Medium
Goodenia salina	P2				X	23.9	May or Aug - Nov	Well-drained, saline, grey or brown loamy clay. Low gypseous dunes near salt pans.[2]	Yes	Medium	Low
Hakea rigida	P2		X		X	61.3	Sep to Oct.	Sandy soils, yellow sand.[2]	Yes	Low	Low
Lepidium merrallii	P2		X			2.5	NA	Clay loam.[2]	Yes	High	Medium
Lepidosperma sp. Kambalda (A.A. Mitchell 5156)	P2				X	45.2	Dec	Lower footslope of basalt hill.[2]	No	Low	Low
Phebalium clavatum	P2		X		X	10.1	Aug - Sep	Sandy soils. Sandplains.[2]	Yes	Medium	Low
Phebalium sp. Yerilgee Sandplain (J. Jackson 223)	P2				X	52.1	Aug	Yellow, orange/red sad, loam. Sandplains.[2]	Yes	Low	Low
Rumex crystallinus	P2				X	55.3	Annual	Arid & semi-arid areas.	Yes	Low	Low
Thysanotus sp. Yellowdine (A.S. George 6040)	P2				X	61.5	Mar or Dec	Yellow sand, sandy clay. Sandplains, undulating ridges.[2]	Yes	Low	Low
Acacia crenulata	P3				X	23.9	April - May or Nov	Clay, sandy clay, yellow sand.[2]	Yes	Medium	Low
Acacia cylindrica	P3				X	63.2	Aug to Oct.	Yellow/brown sand, gravelly soils. Undulating plains, flats.[2]	Yes	Low	Low
Allocasuarina eriochlamys subsp. grossa	P3		X			12.7	Jul	Stony loam, laterite clay. Granite outcrops.[2]	No	High	Low
Alyogyne sp. Great Victoria Desert (D.J. Edinger 6212)	P3				X	2.5	Aug or Dec	Orange, yellow or red sand, sandy loams. Flat plains.[2]	Yes	High	Low
Alyxia tetanifolia	P3				X	21.6	May - Jun or Nov	Sandy clay, loam, concretionary gravel. Drainage lines, near lakes.[2]	Yes	Medium	Low
Angianthus prostratus	P3				X	46.7	Jul - Sep	Red clay or loamy soils. Saline depressions.[2]	Yes	Low	Low
Atriplex lindleyi subsp. conduplicata	P3				X	55.1	NA	Crabhole plains, dry, yellow bare sandy clay, by lakes.[2]	Yes	Low	Low

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Austrostipa blackii	P3		X			1.7	Sep - Nov	Orange, red or brown clay loam, silty sand, sandy clay loam. Gravel, basalt. Winter wet depressions, rocky outcrops, hills sides.[2]	Yes	High	Recorded
Austrostipa turbinata	P3		X			8	Sep - Oct	Hill. Brown sandy clay.[2]	Yes	High	Medium
Bossiaea celata	P3				X	23.3	Sep - Oct	Deep sand. Open mallee.[2]	No	Medium	Low
Bossiaea concinna	P3				X	68.3	Jun - Sep	White or red sand, gravel.[2]	Yes	Low	Low
Calytrix creswellii	P3				X	69.3	Sep to Dec.	Yellow sand, sometimes with lateritic gravel. Sandplains.[2]	Yes	Low	Low
Chrysocephalum apiculatum subsp. norsemanense	P3		X			2.1	Aug - Oct	Well-drained loamy sand. Moderately exposed, gentle undulating plains, hills.[2]	Yes	High	Medium
Cratystylis centralis	P3				X	39.2	Oct	Red sandy loam with ironstone gravel. Flat plains, breakaway country.[2]	Yes	Low	Low
Cryptandra crispula	P3				X	42.7	Aug - Sep	Brown sandy clay, yellow loamy sand, red soil, pebbles. Dune ridges, hills, near salt lakes.[2]	Yes	Low	Low
Cyathostemon verrucosus	P3				X	43.9	Apr or Jul or Aug or Oct	Yellow sand, gentle undulating plain.[2]	Yes	Low	Low
Eremophila annosocaulis	P3				X	69.8	Sep	Stony, flat, sandy plain. Red sand.[2]	Yes	Low	Low
Eremophila arachnoides subsp. tenera	P3				X	71.1	Oct - Dec	Undulating plains, Saline plains, drainage, clay.[2]	Yes	Low	Low
Eremophila veronica	P3		X			0.5	Apr to May.	Stony clay, clay loam. Lateritic breakaways.[2]	No	High	High
Eucalyptus exigua	P3				X	48.7	Mar - Apr or Oct or Dec	Sandy loam, white sand. Sandplains.[2]	Yes	Low	Low
Eucalyptus frenchiana	P3				X	42.2	Oct	Brown or orange loam, sand or sandy clay. Granite. Flat plains, low undulating plains.[2]	Yes	Low	Low
Eutaxia actinophylla	P3				X	64.8	Sep to Oct.	Red-brown clay loam, red clay loam over granite, gravel. Small depressions.	Yes	Low	Low
Gompholobium cinereum	P3				X	19.9	Feb or May or Sep - Nov	Yellow sand, clayey sand, brown loam, sandy gravel, laterite. Well-drained open sites, slopes, plains, roadsides.[2]	Yes	Medium	Low
Grevillea georgeana	P3		X		X	1.1	Jan or Mar or Sep to Nov.	Stony loam/clay. Ironstone hilltops & slopes.	Yes	High	Medium

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Appendix D
Inventory of Vascular Flora

Appendix: Inventory of Vascular Flora

Family	Taxon
Aizoaceae	*Carpobrotus* sp.
Amaranthaceae	*Ptilotus exaltatus*
	Ptilotus holosericeus
	Ptilotus obovatus var. *obovatus*
	Ptilotus polystachyus
Anacardiaceae	**Schinus molle* var. *areira*
Apocynaceae	*Alyxia buxifolia*
	Leichhardtia australis
	Marsdenia australis
	Vincetoxicum lineare
Asparagaceae	**Agave americana*
	Thysanotus manglesianus
Asphodelaceae	**Asphodelus fistulosus*
Asteraceae	**Centaurea melitensis*
	Chrysocephalum puteale
	Cratystylis conocephala
	Olearia muelleri
	Olearia pimeleoides
	**Oligocarpus calendulaceus*
	Rhodanthe chlorocephala subsp. *rosea*
	**Sonchus asper*
	Streptoglossa liatroides
	Vittadinia dissecta var. *hirta*
	Waitzia acuminata var. *acuminata*
Boraginaceae	*Halgania andromedifolia*
	Heliotropium curassavicum
	**Heliotropium europaeum*
Brassicaceae	**Carrichtera annua*
Cactaceae	*Opuntia stricta*
Casuarinaceae	*Allocasuarina ?huegeliana*
	Casuarina pauper
Chenopodiaceae	*Atriplex ?holocarpa*
	Atriplex ?vesicaria
	Atriplex nummularia subsp. *spathulata*
	Atriplex quadrivalvata
	Atriplex sp.
	Atriplex vesicaria
	Chenopodium curvispicatum
	Dysphania melanocarpa forma *leucocarpa*
	?Enchylaena tomentosa
	Enchylaena tomentosa var. *tomentosa*
	Maireana ?georgei
	Maireana ?marginata
	Maireana georgei
	Maireana pentatropis
	Maireana sedifolia
	Maireana tomentosa
	Maireana trichoptera
	Maireana triptera

Appendix: Inventory of Vascular Flora

Family	Taxon
Chenopodiaceae	*Osteocarpum salsuginosum*
	Rhagodia drummondii
	Salsola australis
	Sclerolaena cuneata
	Sclerolaena diacantha
	Sclerolaena fusiformis
	Sclerolaena obliquicuspis
	Tecticornia halocnemoides
Crassulaceae	**Crassula ovata*
Euphorbiaceae	**Euphorbia drummondii*
Fabaceae	*Acacia acuminata*
	Acacia collegialis
	Acacia dissona var. *dissona*
	Acacia erinacea
	Acacia hemiteles
	Acacia jennerae
	Acacia tetragonophylla
	Acacia xerophila var. *brevior*
	Senna artemisioides subsp. *artemisioides*
	Senna artemisioides subsp. *filifolia*
	Senna artemisioides subsp. x *artemisioides*
	Senna stowardii
Frankeniaceae	*Frankenia ?fecunda*
Goodeniaceae	*Goodenia havilandii*
	Goodenia pinnatifida
	Scaevola spinescens
Haloragaceae	*Haloragis trigonocarpa*
Hemerocallidaceae	*Dianella revoluta* var. *divaricata*
Lamiaceae	**Salvia verbenaca*
	Westringia rigida
Malvaceae	*Abutilon cryptopetalum*
	Hibiscus solanifolius
	Hibiscus sturtii var. *grandiflorus*
	Lawrencia repens
	Malvaceae sp.
	Sida petrophila
	Sida ?petrophila
	Calothamnus ?gracilis
	Eucalyptus ?ravida
	Eucalyptus campaspe
	Eucalyptus celastroides
	Eucalyptus clelandiorum
	Eucalyptus griffithsii
	Eucalyptus loxophleba subsp. *lissophloia*
	Eucalyptus oldfieldii
	Eucalyptus oleosa subsp. *oleosa*
	Eucalyptus salmonophloia
	Eucalyptus salubris
	Eucalyptus torquata

Appendix: Inventory of Vascular Flora

Family	Taxon
Myrtaceae	*Eucalyptus websteriana* subsp. *websteriana*
	Melaleuca ?hamata
	Melaleuca pauperiflora subsp. *fastigiata*
Pittosporaceae	*Pittosporum angustifolium*
Poaceae	*Aristida contorta*
	Austrostipa blackii (P3)
	Austrostipa platychaeta
	Austrostipa sp.
	Austrostipa trichophylla
	Chloris truncata
	Enneapogon caerulescens
	Eragrostis dielsii
	Monachather paradoxus
	Rytidosperma sp.
	Triodia desertorum
Polygonaceae	**Rumex vesicarius*
Portulacaceae	*Calandrinia baccata*
	Calandrinia eremaea
Pteridaceae	*Cheilanthes lasiophylla*
	Cheilanthes sieberi subsp. *sieberi*
Rhamnaceae	*Trymalium myrtillus* subsp. *myrtillus*
Rutaceae	*Phebalium laevigatum*
Santalaceae	*Exocarpos aphyllus*
	Santalum acuminatum
	Santalum spicatum
Sapindaceae	*Dodonaea adenophora*
	Dodonaea lobulata
	Dodonaea stenozyga
Scrophulariaceae	*Eremophila alternifolia*
	Eremophila deserti
	Eremophila forrestii
	Eremophila georgei
	Eremophila glabra subsp. *glabra*
	Eremophila interstans subsp. *interstans*
	Eremophila oldfieldii subsp. *angustifolia*
	Eremophila oppositifolia subsp. *angustifolia*
	Eremophila parvifolia subsp. *auricampi*
	Eremophila scoparia
	Myoporum platycarpum subsp. *platycarpum*
Solanaceae	*Lycium australe*
	**Nicotiana glauca*
	Nicotiana rotundifolia
	Solanum cleistogamum
	Solanum lasiophyllum
	Solanum nummularium
Thymelaeaceae	*?Pimelea* sp.
	Pimelea microcephala subsp. *microcephala*
	Pimelea spiculigera var. *thesioides*
Zygophyllaceae	*Roepera glauca*

Appendix: Inventory of Vascular Flora

Family	Taxon
Zygophyllaceae	*Roepera ovata*
	Roepera sp.

Appendix E
Flora Site Data

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q01
Location MGA 50 326500 **mE** 6578134 **mN**

Described by: JW
Date: 12/10/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Laterite, quartz

Vegetation: *Eremophila georgei tall open shrubland over Dodonaea lobulata mid open shrubland over Ptilotus obovatus var. obovatus, Sida petrophila and Vincetoxicum lineare low open herbland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Abutilon cryptopetalum	10	0.1	
Aristida contorta	10	0.1	
Austrostipa blackii (P3)	10	1	
Calandrinia eremaea	10	0.1	
Dodonaea lobulata	150	12	
Eremophila georgei	300	28	
Nicotiana rotundifolia	10	0.1	
Ptilotus obovatus var. obovatus	35	16	
Sida petrophila	25	11	
Solanum cleistogamum	10	0.1	
Solanum lasiophyllum	25	1	
Vincetoxicum lineare	10	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q02
Location MGA 50 326422 **mE** 6578029 **mN**

Described by: JW
Date: 12/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eucalyptus celastroides and Eucalyptus clelandiorum low woodland over Eremophila scoparia mid sparse shrubland over Atriplex sp., Atriplex vesicaria and Atriplex nummularia subsp. spathulata low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex nummularia subsp. spathulata	35	6	
Atriplex sp.	35	16	
Atriplex vesicaria	50	7	
Dodonaea stenozyga	25	1	
Eremophila scoparia	120	6	
Eucalyptus celastroides	500	16	
Eucalyptus clelandiorum	1000	5	
Exocarpos aphyllus	45	1	
Haloragis trigonocarpa	25	0.5	
Lycium australe	40	2	
Ptilotus holosericeus	5	0.1	
Ptilotus obovatus var. obovatus	35	1	
Roepera sp.	10	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q03
Location MGA 50 327421 **mE** 6577933 **mN**

Described by: JW
Date: 12/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eucalyptus campaspe low woodland over Eremophila scoparia mid sparse shrubland over Senna artemisioides subsp. x artemisioides, Atriplex sp. and Olearia muelleri low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex sp.	40	6	
**Carrichtera annua*	25	2	
Eremophila scoparia	140	3	
Eucalyptus campaspe	300	26	
Olearia muelleri	50	6	
Ptilotus obovatus var. obovatus	20	2	
Senna artemisioides subsp. x artemisioides	100	12	
Streptoglossa liatroides	5	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q04
Location MGA 50 327671 **mE** 6577991 **mN**

Described by: JW
Date: 12/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: N/A

Vegetation: *Exocarpos aphyllus, Eremophila oldfieldii subsp. angustifolia and Acacia tetragonophylla mid shrubland over Dodonaea lobulata mid open shrubland over Scaevola spinescens, Olearia muelleri and Eremophila alternifolia low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia tetragonophylla	180	6	
Dodonaea lobulata	110	12	
Eremophila alternifolia	50	1	
Eremophila oldfieldii subsp. angustifolia	200	12	
Exocarpos aphyllus	200	26	
Lycium australe	5	0.1	
Maireana georgei	18	1	
Marsdenia australis	10	1	
Olearia muelleri	45	2	
Ptilotus obovatus var. obovatus	20	1	
Scaevola spinescens	100	6	
Thysanotus manglesianus	100	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q05
Location MGA 50 327597 **mE** 6577741 **mN**

Described by: JW
Date: 12/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eucalyptus clelandiorum and Eucalyptus campaspe low open woodland over Eremophila scoparia and Senna artemisioides subsp. x artemisioides mid open shrubland over Cheilanthes lasiophylla and Ptilotus obovatus var. obovatus low sparse herbland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Cheilanthes lasiophylla	15	4	
Eremophila oldfieldii subsp. angustifolia	35	0.1	
Eremophila scoparia	200	20	
Eucalyptus campaspe	300	4	
Eucalyptus clelandiorum	500	5	
Maireana ?marginata	5	1	
Olearia muelleri	20	1	
Ptilotus obovatus var. obovatus	30	1	
Senna artemisioides subsp. x artemisioides	130	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q06
Location MGA 50 327323 **mE** 6576260 **mN**

Described by: JW
Date: 12/10/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Laterite, quartz

Vegetation: *Exocarpos aphyllus tall open shrubland over Dodonaea lobulata and Dodonaea adenophora low shrubland over Haloragis trigonocarpa, Thysanotus manglesianus and Ptilotus obovatus var. obovatus low open herbland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Dodonaea adenophora	100	12	
Dodonaea lobulata	90	25	
Exocarpos aphyllus	220	11	
Haloragis trigonocarpa	10	11	
Ptilotus obovatus var. obovatus	20	1	
Thysanotus manglesianus	20	2	
Waitzia acuminata var. acuminata	18	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q07
Location MGA 50 328895 **mE** 6577682 **mN**

Described by: JW
Date: 13/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eucalyptus torquata low woodland over Exocarpos aphyllus mid sparse shrubland over Westringia rigida, Olearia muelleri and Scaevola spinescens low shrubland*

Condition: Excellent **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eremophila parvifolia subsp. auricampi	40	5	
Eucalyptus torquata	400	12	
Exocarpos aphyllus	110	1	
Olearia muelleri	25	11	
Scaevola spinescens	40	6	
Westringia rigida	40	16	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q08
Location MGA 50 328889 **mE** 6577825 **mN**

Described by: JW
Date: 13/10/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: N/A

Vegetation: *Eucalyptus campaspe and Eucalyptus griffithsii low open woodland over Eremophila scoparia, Senna artemisioides subsp. filifolia and Exocarpos aphyllus mid shrubland over Senna artemisioides subsp. x artemisioides, Acacia erinacea and Olearia muelleri low shrubland*

Condition: Excellent **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia erinacea	40	13	
Eremophila interstans subsp. interstans	200	4	
Eremophila oldfieldii subsp. angustifolia	35	1	
Eremophila scoparia	140	23	
Eucalyptus campaspe	400	5	
Eucalyptus griffithsii	500	5	
Exocarpos aphyllus	200	8	
Lycium australe	100	0.1	
Maireana georgei	20	0.1	
Myoporum platycarpum subsp. platycarpum	100	1	
Olearia muelleri	35	3	
Santalum acuminatum	55	1	
Senna artemisioides subsp. x artemisioides	100	15	
Senna artemisioides subsp. filifolia	140	10	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q09
Location MGA 50 328932 **mE** 6578002 **mN**

Described by: JW
Date: 13/10/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Laterite

Vegetation: *Eucalyptus oleosa subsp. oleosa low open woodland over Eremophila oldfieldii subsp. angustifolia, Senna artemisioides subsp. filifolia and Trymalium myrtillus subsp. myrtillus mid shrubland over Westringia rigida, Eremophila parvifolia subsp. auricampi and Calothamnus ?gracilis low shrubland*

Condition: Excellent **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia jennerae	25	1	
Alyxia buxifolia	40	1	
Atriplex vesicaria	60	5	
Calothamnus ?gracilis	70	6	
Dodonaea stenozyga	185	5	
Eremophila oldfieldii subsp. angustifolia	200	15	
Eremophila oppositifolia subsp. angustifolia	130	5	
Eremophila parvifolia subsp. auricampi	50	12	
Eucalyptus oleosa subsp. oleosa	700	10	
Ptilotus obovatus var. obovatus	15	1	
Senna artemisioides subsp. filifolia	200	11	
Trymalium myrtillus subsp. myrtillus	140	11	
Westringia rigida	25	15	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q10
Location MGA 50 328368 **mE** 6578263 **mN**

Described by: JW
Date: 13/10/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: N/A

Vegetation: *Eucalyptus griffithsii low open woodland over Acacia jennerae, Eremophila oldfieldii subsp. angustifolia and Exocarpos aphyllus mid open shrubland over Eremophila glabra subsp. glabra, Dodonaea stenozyga and Olearia pimeleoides low shrubland*

Condition: Excellent **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia jennerae	110	10	
Aristida contorta	100	1	
Dodonaea stenozyga	100	6	
Eremophila glabra subsp. glabra	60	18	
Eremophila oldfieldii subsp. angustifolia	120	5	
Eucalyptus griffithsii	400	5	
Exocarpos aphyllus	130	5	
Olearia pimeleoides	25	6	
Ptilotus obovatus var. obovatus	10	0.1	
Santalum spicatum	180	3	
Senna artemisioides subsp. filifolia	120	5	
Westringia rigida	20	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q20
Location MGA 50 328215 **mE** 6578113 **mN**

Described by: JW
Date: 13/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila oldfieldii subsp. angustifolia tall open shrubland over Eremophila interstans subsp. interstans mid open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia jennerae	100	5	
Eremophila interstans subsp. interstans	120	15	
Eremophila oldfieldii subsp. angustifolia	300	19	
Eremophila parvifolia subsp. auricampi	45	6	
Eucalyptus griffithsii	400	2	
Maireana sedifolia	80	3	
Olearia pimeleoides	30	5	
Senna artemisioides subsp. x artemisioides	100	2	
Sida petrophila	28	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q21
Location MGA 50 326536 **mE** 6577327 **mN**

Described by: JW
Date: 13/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite

Vegetation: *Dodonaea stenozyga, Senna artemisioides subsp. filifolia and Eremophila oldfieldii subsp. angustifolia mid closed shrubland over Atriplex vesicaria low sparse shrubland over Ptilotus obovatus var. obovatus low open herbland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex vesicaria	80	5	
Dodonaea stenozyga	180	40	
Eremophila oldfieldii subsp. angustifolia	140	15	
Ptilotus obovatus var. obovatus	28	16	
Senna artemisioides subsp. filifolia	180	20	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q22
Location MGA 50 326045 **mE** 6577335 **mN**

Described by: JW
Date: 13/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eucalyptus salmonophloia low open woodland over Senna artemisioides subsp. x artemisioides and Senna artemisioides subsp. filifolia low sparse shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eucalyptus salmonophloia	600	5	
Senna artemisioides subsp. x artemisioides	45	6	
Senna artemisioides subsp. filifolia	35	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q23
Location MGA 50 326813 **mE** 6577450 **mN**

Described by: JW
Date: 14/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eucalyptus salmonophloia low woodland over Senna artemisioides subsp. x artemisioides, Senna artemisioides subsp. filifolia and Eremophila parvifolia subsp. auricampi low sparse shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eremophila parvifolia subsp. auricampi	35	1	
Eucalyptus salmonophloia	1000	19	
Senna artemisioides subsp. x artemisioides	100	2	
Senna artemisioides subsp. filifolia	75	2	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q24
Location MGA 50 326578 **mE** 6577758 **mN**

Described by: JW
Date: 14/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eucalyptus campaspe low woodland over Senna artemisioides subsp. x artemisioides mid sparse shrubland over Senna artemisioides subsp. filifolia low sparse shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eucalyptus campaspe	400	15	
Senna artemisioides subsp. x artemisioides	130	2	
Senna artemisioides subsp. filifolia	45	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q25
Location MGA 50 326770 **mE** 6578110 **mN**

Described by: JW
Date: 14/10/2021
Type: QUADRAT

Landform: Upper slope
Rock Type: N/A

Vegetation: *Acacia acuminata tall open shrubland over Eremophila oldfieldii subsp. angustifolia mid sparse shrubland over Sida petrophila, Solanum lasiophyllum and Dodonaea stenozyga low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	400	20	
Austrostipa sp.	10	1	
Dodonaea stenozyga	50	1	
Eremophila georgei	20	0.1	
Eremophila oldfieldii subsp. angustifolia	130	10	
Haloragis trigonocarpa	10	3	
Ptilotus exaltatus	30	1	
Ptilotus obovatus var. obovatus	20	1	
Senna artemisioides subsp. filifolia	30	0.1	
Sida petrophila	100	5	
Solanum lasiophyllum	30	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q26
Location MGA 50 327707 **mE** 6577970 **mN**

Described by: JW
Date: 14/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: N/A

Vegetation: *Eremophila oldfieldii subsp. angustifolia, Dodonaea lobulata and Senna artemisioides subsp. x artemisioides mid shrubland over Ptilotus obovatus var. obovatus low sparse herbland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Dodonaea lobulata	140	12	
Eremophila oldfieldii subsp. angustifolia	190	20	
Ptilotus obovatus var. obovatus	35	1	
Senna artemisioides subsp. x artemisioides	170	12	
Senna artemisioides subsp. filifolia	200	10	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q27
Location MGA 50 327762 **mE** 6578035 **mN**

Described by: JW
Date: 14/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: N/A

Vegetation: *Eucalyptus torquata low open woodland over Eremophila interstans subsp. interstans, Senna artemisioides subsp. filifolia and Olearia muelleri low sparse shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eremophila interstans subsp. interstans	50	2	
Eucalyptus torquata	500	8	
Exocarpos aphyllus	25	0.1	
Maireana tomentosa	10	1	
Olearia muelleri	35	1	
Senna artemisioides subsp. filifolia	55	2	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q28
Location MGA 50 327436 **mE** 6575925 **mN**

Described by: JW
Date: 14/10/2021
Type: QUADRAT

Landform: Gentle slope
Rock Type: Laterite

Vegetation: *Acacia acuminata tall open shrubland over Eremophila oldfieldii subsp. angustifolia mid sparse shrubland over Dodonaea stenozyga and Senna artemisioides subsp. filifolia low closed shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	300	15	
Austrostipa platychaeta	18	2	
Calandrinia baccata	10	2	
Dodonaea stenozyga	80	70	
Eremophila oldfieldii subsp. angustifolia	120	6	
Goodenia havilandii	18	1	
Haloragis trigonocarpa	18	1	
Lycium australe	10	0.1	
Maireana pentatropis	10	0.1	
Ptilotus exaltatus	25	1	
Ptilotus obovatus var. obovatus	40	1	
Senna artemisioides subsp. filifolia	100	5	
Thysanotus manglesianus	20	3	
Waitzia acuminata var. acuminata	15	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q29
Location MGA 50 328203 **mE** 6575013 **mN**

Described by: JW
Date: 14/10/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite

Vegetation: *Eucalyptus torquata low open woodland over Eremophila oldfieldii subsp. angustifolia, Senna artemisioides subsp. x artemisioides and Dodonaea stenozyga mid open shrubland over Ptilotus obovatus var. obovatus and Ptilotus exaltatus low sparse herbland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia jennerae	45	1	
Dodonaea stenozyga	150	3	
Eremophila oldfieldii subsp. angustifolia	200	6	
Eremophila parvifolia subsp. auricampi	35	3	
Eucalyptus torquata	400	5	
Olearia muelleri	25	1	
Ptilotus exaltatus	20	1	
Ptilotus obovatus var. obovatus	35	3	
Senna artemisioides subsp. x artemisioides	190	6	
Senna artemisioides subsp. filifolia	190	3	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1Q30
Location MGA 50 328220 **mE** 6575082 **mN**

Described by: JW
Date: 14/10/2021
Type: QUADRAT

Landform: Rocky plain
Rock Type: Laterite

Vegetation: *Allocasuarina ?huegeliana and Eucalyptus torquata low woodland over Santalum spicatum and Eremophila oppositifolia subsp. angustifolia mid sparse shrubland over Dodonaea stenozyga, Eremophila glabra subsp. glabra and Atriplex vesicaria low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Allocasuarina ?huegeliana	400	6	
Atriplex vesicaria	100	3	
Dodonaea stenozyga	80	6	
Eremophila glabra subsp. glabra	90	6	
Eremophila oppositifolia subsp. angustifolia	190	1	
Eucalyptus torquata	700	5	
Maireana pentatropis	25	0.1	
Ptilotus exaltatus	20	1	
Ptilotus obovatus var. obovatus	15	1	
Santalum spicatum	150	2	
Senna artemisioides subsp. filifolia	100	3	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R01
Location MGA 50 328967 **mE** 6577693 **mN**

Described by: JW
Date: 13/10/2021
Type: RELEVE

Landform: Plain
Rock Type: N/A

Vegetation: *Eucalyptus torquata low open woodland over Exocarpos aphyllus tall sparse shrubland over Eremophila parvifolia subsp. auricampi, Westringia rigida and Senna artemisioides subsp. filifolia low sparse shrubland*

Condition: Excellent **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eremophila parvifolia subsp. auricampi	32	3	
Eucalyptus torquata	400	5	
Exocarpos aphyllus	220	6	
Olearia muelleri	40	1	
Senna artemisioides subsp. filifolia	35	2	
Westringia rigida	35	3	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R02
Location MGA 50 328922 **mE** 6577745 **mN**

Described by: JW
Date: 13/10/2021
Type: RELEVE

Landform: Plain
Rock Type: N/A

Vegetation: *Eucalyptus torquata low woodland over Eremophila interstans subsp. interstans mid sparse shrubland over Senna artemisioides subsp. filifolia, Olearia muelleri and Westringia rigida low open shrubland*

Condition: Excellent **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eremophila georgei	28	0.1	
Eremophila interstans subsp. interstans	200	4	
Eucalyptus torquata	500	16	
Olearia muelleri	25	4	
Senna artemisioides subsp. filifolia	40	6	
Westringia rigida	25	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R03
Location MGA 50 329002 **mE** 6577925 **mN**

Described by: JW
Date: 13/10/2021
Type: RELEVE

Landform: Plain
Rock Type: Laterite

Vegetation: *Eucalyptus torquata low open woodland over Eremophila alternifolia tall sparse shrubland over Dodonaea stenozyga and Eremophila oldfieldii subsp. angustifolia mid sparse shrubland*

Condition: Excellent **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia jennerae	60	2	
Dodonaea stenozyga	120	5	
Eremophila alternifolia	210	2	
Eremophila oldfieldii subsp. angustifolia	110	5	
Eucalyptus torquata	400	2	
Maireana tomentosa	25	1	
Westringia rigida	25	2	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R04
Location MGA 50 326478 **mE** 6577408 **mN**

Described by: JW
Date: 13/10/2021
Type: RELEVE

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eremophila oldfieldii subsp. angustifolia tall open shrubland over Senna artemisioides subsp. x artemisioides and Senna artemisioides subsp. filifolia mid open shrubland over Ptilotus obovatus var. obovatus low open herbland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Dodonaea stenozyga	100	12	
Enchylaena tomentosa var. tomentosa	45	1	
Eremophila oldfieldii subsp. angustifolia	250	15	
Eremophila parvifolia subsp. auricampi	25	1	
Ptilotus obovatus var. obovatus	45	28	
Senna artemisioides subsp. x artemisioides	120	10	
Senna artemisioides subsp. filifolia	110	6	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R05
Location MGA 50 326536 **mE** 6577327 **mN**

Described by: JW
Date: 13/10/2021
Type: RELEVE

Landform: Mid slope
Rock Type: N/A

Vegetation: *Eucalyptus torquata and Eucalyptus salmonophloia low woodland over Exocarpos aphyllus mid sparse shrubland over Senna artemisioides subsp. filifolia and Senna artemisioides subsp. x artemisioides low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eucalyptus salmonophloia	500	10	
Eucalyptus torquata	400	5	
Exocarpos aphyllus	140	2	
Senna artemisioides subsp. x artemisioides	45	1	
Senna artemisioides subsp. filifolia	90	11	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R09
Location MGA 50 326358 **mE** 6577538 **mN**

Described by: JW
Date: 14/10/2021
Type: RELEVE

Landform: Plain
Rock Type: Laterite

Vegetation: *Eucalyptus celastroides and Eucalyptus clelandiorum low woodland over Atriplex vesicaria low sparse shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex vesicaria	40	1	
Eucalyptus celastroides	400	6	
Eucalyptus clelandiorum	400	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R10
Location MGA 50 326982 **mE** 6578150 **mN**

Described by: JW
Date: 14/10/2021
Type: RELEVE

Landform: Undulating plain
Rock Type: N/A

Vegetation: *Eucalyptus clelandiorum low open woodland over Senna artemisioides subsp. x artemisioides, Atriplex vesicaria and Eremophila interstans subsp. interstans low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex vesicaria	28	1	
Eremophila interstans subsp. interstans	45	1	
Eucalyptus clelandiorum	1000	5	
Senna artemisioides subsp. x artemisioides	35	10	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R11
Location MGA 50 327829 **mE** 6578083 **mN**

Described by: JW
Date: 14/10/2021
Type: RELEVE

Landform: Plain
Rock Type: Laterite, quartz

Vegetation: *Eucalyptus torquata mid open woodland over Eremophila interstans subsp. interstans mid open shrubland over Senna artemisioides subsp. x artemisioides, Senna artemisioides subsp. filifolia and Acacia jennerae low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia jennerae	10	3	
Eremophila interstans subsp. interstans	150	16	
Eucalyptus torquata	1500	5	
Olearia muelleri	35	2	
Senna artemisioides subsp. x artemisioides	40	5	
Senna artemisioides subsp. filifolia	25	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C1R13
Location MGA 50 327488 **mE** 6575973 **mN**

Described by: JW
Date: 14/10/2021
Type: RELEVE

Landform: Undulating plain
Rock Type: N/A

Vegetation: *Eucalyptus clelandiorum, Eucalyptus salmonophloia and Eucalyptus griffithsii low woodland over Eremophila interstans subsp. interstans and Eremophila oldfieldii subsp. angustifolia tall open shrubland over Atriplex nummularia subsp. spathulata and Dodonaea stenozyga low open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex nummularia subsp. spathulata	45	11	
Dodonaea stenozyga	10	6	
Eremophila interstans subsp. interstans	220	11	
Eremophila oldfieldii subsp. angustifolia	200	10	
Eucalyptus clelandiorum	500	6	
Eucalyptus griffithsii	300	5	
Eucalyptus salmonophloia	400	6	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q01
Location MGA 50 326721 **mE** 6571821 **mN**

Described by: JW
Date: 15/11/2021
Type: QUADRAT

Landform: Scree slope drain line
Rock Type: Laterite

No photo available

Vegetation: *Eucalyptus loxophleba subsp. lissophloia and Eucalyptus campaspe low open woodland over Eremophila oldfieldii subsp. angustifolia mid sparse shrubland over Dodonaea adenophora and Olearia muelleri low sparse shrubland*
Condition: Good **Disturbance Type:** Fauna tracks/scats,Infrastructure

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Dodonaea adenophora	35	1	
Eremophila glabra subsp. glabra	5	0.1	
Eremophila oldfieldii subsp. angustifolia	130	2	
Eucalyptus campaspe	300	1	
Eucalyptus loxophleba subsp. lissophloia	300	2	
Maireana georgei	15	0.1	
Olearia muelleri	25	0.5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q02
Location MGA 50 324588 **mE** 6571695 **mN**

Described by: BD,SW
Date: 15/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Ironstone

Vegetation: *Eucalyptus salmonophloia low woodland over Melaleuca ?hamata and Eremophila oppositifolia subsp. angustifolia tall open shrubland over Olearia muelleri low sparse shrubland*

Condition: Very Good **Disturbance Type:** Litter

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	40	0.1	
Acacia hemiteles	160	1	
Enchylaena tomentosa var. tomentosa	40	0.1	
Eremophila oppositifolia subsp. angustifolia	250	4	
Eremophila parvifolia subsp. auricampi	60	0.1	
Eucalyptus salmonophloia	650	12	
Exocarpos aphyllus	150	0.5	
Melaleuca ?hamata	300	11	
Olearia muelleri	45	5	
Olearia pimeleoides	30	0.1	
Pimelea microcephala subsp. microcephala	50	0.1	
Ptilotus obovatus var. obovatus	30	0.1	
Scaevola spinescens	120	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q03
Location MGA 50 327534 **mE** 6572097 **mN**

Described by: JW
Date: 15/11/2021
Type: QUADRAT

Landform: Drainage line
Rock Type: Laterite

No photo available

Vegetation: *Atriplex ?vesicaria and Senna artemisioides subsp. x artemisioides low sparse shrubland*

Condition: Good **Disturbance Type:** Vehicle tracks

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	100	5	
Eremophila forrestii	20	0.1	
Eremophila scoparia	130	0.1	
Maireana georgei	5	0.1	
Senna artemisioides subsp. x artemisioides	60	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q04
Location MGA 50 324603 **mE** 6571566 **mN**

Described by: BD,SW
Date: 15/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Ironstone

Vegetation: *Eucalyptus ?ravida low open forest over Eremophila interstans subsp. interstans, Melaleuca ?hamata and Melaleuca pauperiflora subsp. fastigiata tall open shrubland over Triodia desertorum low sparse hummock grassland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	170	0.1	
Acacia hemiteles	140	0.1	
Atriplex nummularia subsp. spathulata	35	0.1	
Dodonaea lobulata	100	0.1	
Eremophila interstans subsp. interstans	210	11	
Eremophila oppositifolia subsp. angustifolia	110	0.1	
Eremophila parvifolia subsp. auricampi	30	0.1	
Eucalyptus ?ravida	550	35	
Exocarpos aphyllus	90	0.1	
Halgania andromedifolia	70	6	
Maireana georgei	30	0.1	
Melaleuca ?hamata	250	2	
Melaleuca pauperiflora subsp. fastigiata	350	1	
Myoporum platycarpum subsp. platycarpum	210	1	
Olearia muelleri	30	0.1	
Phebalium laevigatum	120	1	
Scaevola spinescens	45	5	
Sclerolaena fusiformis	10	0.1	
Triodia desertorum	25	2	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q05
Location MGA 50 327403 **mE** 6572169 **mN**

Described by: JW
Date: 15/11/2021
Type: QUADRAT

Landform: Scree slope minor drain No photo available
Rock Type: Laterite

Vegetation: *Eucalyptus campaspe low open woodland over Eremophila oldfieldii subsp. angustifolia tall open shrubland over Dodonaea stenozyga, Alyxia buxifolia and Eremophila glabra subsp. glabra low open shrubland*
Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Alyxia buxifolia	70	1	
Dodonaea stenozyga	90	15	
Eremophila glabra subsp. glabra	100	1	
Eremophila oldfieldii subsp. angustifolia	200	15	
Eucalyptus campaspe	200	1	
Maireana georgei	15	0.1	
Olearia muelleri	20	0.1	
Ptilotus obovatus var. obovatus	35	5	
Senna artemisioides subsp. filifolia	110	10	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q06
Location MGA 50 324605 **mE** 6571453 **mN**

Described by: BD,SW
Date: 15/11/2021
Type: QUADRAT

Landform: Low rise
Rock Type: Ironstone,Quartz

Vegetation: *Eucalyptus clelandiorum and Eucalyptus ?ravida low open woodland over Eremophila oppositifolia subsp. angustifolia and Myoporum platycarpum subsp. platycarpum mid open shrubland over Scaevola spinescens, Dodonaea lobulata and Phebalium laevigatum low open shrubland*

Condition: Good **Disturbance Type:** Litter,Historical Clearing

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	120	0.1	
Acacia tetragonophylla	150	0.1	
Atriplex nummularia subsp. spathulata	120	0.1	
Dodonaea lobulata	100	1	
Eremophila oppositifolia subsp. angustifolia	140	8	
Eremophila parvifolia subsp. auricampi	30	0.1	
Eucalyptus ?ravida	450	2	
Eucalyptus clelandiorum	700	5	
Halgania andromedifolia	100	0.1	
Maireana georgei	15	0.1	
Myoporum platycarpum subsp. platycarpum	190	4	
Olearia muelleri	30	0.5	
Phebalium laevigatum	80	1	
Ptilotus obovatus var. obovatus	30	0.1	
Scaevola spinescens	90	20	
Solanum lasiophyllum	20	0.1	
Triodia desertorum	30	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q07
Location MGA 50 327549 **mE** 6571711 **mN**

Described by: JW
Date: 15/11/2021
Type: QUADRAT

Landform: Scree slope
Rock Type: Laterite

No photo available

Vegetation: *Eremophila interstans subsp. interstans tall open shrubland over Dodonaea stenozyga, Senna artemisioides subsp. filifolia and Alyxia buxifolia mid open shrubland over Maireana georgei low sparse chenopod shrubland*
Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Alyxia buxifolia	110	1	
Cheilanthes sieberi subsp. sieberi	25	0.1	
Dodonaea stenozyga	170	5	
Eremophila interstans subsp. interstans	250	15	
Maireana georgei	15	2	
Malvaceae sp.	5	0.1	
Senna artemisioides subsp. filifolia	190	5	
Solanum cleistogamum	15	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q08
Location MGA 50 324706 **mE** 6571242 **mN**

Described by: BD,SW
Date: 15/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Ironstone,Quartz

Vegetation: *Eucalyptus clelandiorum and Eucalyptus salmonophloia mid open woodland over Eremophila interstans subsp. interstans mid sparse shrubland over Maireana trichoptera, Atriplex ?vesicaria and Sclerolaena fusiformis low sparse chenopod shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	30	1	
Atriplex nummularia subsp. spathulata	100	0.1	
Eremophila interstans subsp. interstans	160	2	
Eremophila parvifolia subsp. auricampi	40	1	
Eucalyptus clelandiorum	1100	2	
Eucalyptus salmonophloia	1100	2	
Exocarpos aphyllus	40	0.1	
Maireana georgei	15	0.1	
Maireana trichoptera	8	2	
Olearia muelleri	35	0.1	
Ptilotus obovatus var. obovatus	40	0.1	
Scaevola spinescens	80	1	
Sclerolaena diacantha	10	0.5	
Sclerolaena fusiformis	5	1	
Senna artemisioides subsp. filifolia	100	0.1	
Senna stowardii	60	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q09
Location MGA 50 327372 **mE** 6571654 **mN**

Described by: JW
Date: 15/11/2021
Type: QUADRAT

Landform: Slope
Rock Type: Laterite

No photo available

Vegetation: *Eremophila oldfieldii subsp. angustifolia tall open shrubland over Dodonaea stenozyga and Acacia acuminata mid sparse shrubland over Ptilotus obovatus var. obovatus and Cheilanthes sieberi subsp. sieberi low sparse herbland*
Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	140	2	
Cheilanthes sieberi subsp. sieberi	35	0.5	
Dodonaea stenozyga	200	10	
Eremophila oldfieldii subsp. angustifolia	250	25	
Ptilotus obovatus var. obovatus	25	10	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q10
Location MGA 50 324887 **mE** 6571294 **mN**

Described by: BD,SW
Date: 15/11/2021
Type: QUADRAT

Landform: Drainage line
Rock Type: Calcrete,Ironstone,Quartz

Vegetation: *Eucalyptus salubris low woodland over Eremophila oldfieldii subsp. angustifolia, Dodonaea lobulata and Eremophila glabra subsp. glabra mid open shrubland over Atriplex ?vesicaria low sparse chenopod shrubland*

Condition: Very Good **Disturbance Type:** Litter

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	40	3	
Atriplex nummularia subsp. spathulata	150	0.1	
Dodonaea lobulata	130	4	
Eremophila glabra subsp. glabra	150	4	
Eremophila interstans subsp. interstans	210	0.1	
Eremophila oldfieldii subsp. angustifolia	180	11	
Eremophila parvifolia subsp. auricampi	50	0.1	
Eucalyptus salubris	900	20	
Exocarpos aphyllus	150	0.1	
Maireana georgei	30	0.1	
Maireana trichoptera	10	0.1	
Olearia muelleri	35	0.1	
Ptilotus exaltatus	3	0.1	
Scaevola spinescens	100	0.1	
Sclerolaena obliquicuspis	10	0.1	
Senna artemisioides subsp. filifolia	150	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q11
Location MGA 50 326763 **mE** 6571675 **mN**

Described by: JW
Date: 15/11/2021
Type: QUADRAT

Landform: Drainage line
Rock Type: Granite,Laterite,Quartz

Vegetation: *Eucalyptus oleosa subsp. oleosa low woodland over Eremophila interstans subsp. interstans mid sparse shrubland over Dodonaea stenozyga, Acacia jennerae and Eremophila glabra subsp. glabra low sparse shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia jennerae	35	1	
Dodonaea stenozyga	38	5	
Eremophila glabra subsp. glabra	45	1	
Eremophila interstans subsp. interstans	200	1	
Eucalyptus oleosa subsp. oleosa	500	15	
Maireana georgei	20	0.1	
Olearia muelleri	40	1	
Ptilotus exaltatus	15	0.1	
Ptilotus obovatus var. obovatus	20	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q12
Location MGA 50 325065 **mE** 6571260 **mN**

Described by: BD,SW
Date: 15/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Ironstone,Laterite,Quartz

Vegetation: *Eucalyptus salmonophloia mid woodland over Senna artemisioides subsp. filifolia mid isolated shrubs*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eremophila interstans subsp. interstans	400	0.1	
Eremophila parvifolia subsp. auricampi	25	0.1	
Eucalyptus salmonophloia	1500	25	
Senna artemisioides subsp. filifolia	150	0.5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q13
Location MGA 50 327631 **mE** 6571898 **mN**

Described by: JW
Date: 16/11/2021
Type: QUADRAT

Landform: Ridge crest
Rock Type: Laterite

Vegetation: *Eucalyptus oldfieldii low open woodland over Dodonaea stenozyga mid sparse shrubland over Atriplex vesicaria, Senna artemisioides subsp. filifolia and Maireana pentatropis low shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex vesicaria	35	15	
Dodonaea stenozyga	110	8	
Eucalyptus oldfieldii	300	5	
Maireana pentatropis	5	5	
Olearia muelleri	20	0.1	
Ptilotus obovatus var. obovatus	15	6	
Senna artemisioides subsp. filifolia	45	15	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q14
Location MGA 50 325050 **mE** 6570941 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Ironstone

Vegetation: *Acacia collegialis and Eremophila oldfieldii subsp. angustifolia tall sparse shrubland over Dodonaea lobulata and Eremophila alternifolia mid sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia collegialis	400	6	
Acacia tetragonophylla	100	0.1	
Chenopodium curvispicatum	10	0.1	
Dodonaea lobulata	180	5	
Eremophila alternifolia	190	4	
Eremophila oldfieldii subsp. angustifolia	250	1	
Maireana georgei	20	0.1	
Maireana trichoptera	8	0.1	
Ptilotus obovatus var. obovatus	25	0.1	
Rhagodia drummondii	5	0.1	
Sclerolaena diacantha	5	0.1	
Sclerolaena fusiformis	10	0.1	
Sida ?petrophila	15	0.1	
Solanum lasiophyllum	10	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q15
Location MGA 50 327026 **mE** 6571767 **mN**

Described by: JW
Date: 16/11/2021
Type: QUADRAT

Landform: Lower slope
Rock Type: Laterite

Vegetation: *Eucalyptus clelandiorum and Eucalyptus oldfieldii low open woodland over Atriplex ?vesicaria and Eremophila interstans subsp. interstans mid shrubland over Dodonaea stenozyga, Olearia muelleri and Maireana pentatropis low open shrubland*

Condition: Good **Disturbance Type:** Fauna tracks/scats,Historical Clearing

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	120	35	
Dodonaea stenozyga	90	6	
Eremophila interstans subsp. interstans	190	20	
Eucalyptus clelandiorum	400	2	
Eucalyptus oldfieldii	60	2	
Maireana georgei	5	0.1	
Maireana pentatropis	20	1	
Olearia muelleri	20	5	
Ptilotus obovatus var. obovatus	15	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q16
Location MGA 50 324948 **mE** 6570710 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Ironstone

Vegetation: *Eucalyptus griffithsii mid woodland over Eremophila oldfieldii subsp. angustifolia tall sparse shrubland over Eremophila interstans subsp. interstans mid sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	30	0.1	
Dodonaea lobulata	80	1	
Eremophila glabra subsp. glabra	40	0.5	
Eremophila interstans subsp. interstans	180	3	
Eremophila oldfieldii subsp. angustifolia	500	2	
Eucalyptus griffithsii	1100	25	
Maireana trichoptera	20	0.1	
Olearia muelleri	40	1	
Ptilotus obovatus var. obovatus	25	0.1	
Rhagodia drummondii	20	0.1	
Senna artemisioides subsp. filifolia	40	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q17
Location MGA 50 327349 **mE** 6571149 **mN**

Described by: JW
Date: 16/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite,Sandstone,Shale

Vegetation: *Atriplex vesicaria, Maireana georgei and Maireana pentatropis low chenopod shrubland over *Asphodelus fistulosus low sparse herbland*

Condition: Poor **Disturbance Type:** Vehicle tracks,Fauna tracks/scats,Historical Clearing,Infrastructure

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
**Asphodelus fistulosus*	35	10	
Atriplex vesicaria	100	26	
Maireana georgei	10	15	
Maireana pentatropis	20	10	
**Salvia verbenaca*	10	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q18
Location MGA 50 324668 **mE** 6570076 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: QUADRAT

Landform: Hilltop
Rock Type: Calcrete,Ironstone

Vegetation: *Acacia collegialis and Eremophila oldfieldii subsp. angustifolia tall sparse shrubland over Dodonaea lobulata mid sparse shrubland over Senna artemisioides subsp. filifolia low sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia collegialis	350	5	
Atriplex nummularia subsp. spathulata	140	0.1	
Dodonaea lobulata	140	5	
Enchylaena tomentosa var. tomentosa	40	0.1	
Eremophila oldfieldii subsp. angustifolia	350	5	
Maireana pentatropis	15	0.1	
Maireana trichoptera	15	0.1	
Ptilotus obovatus var. obovatus	25	1	
Santalum acuminatum	250	0.1	
Scaevola spinescens	130	0.1	
Senna artemisioides subsp. filifolia	15	2	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q19
Location MGA 50 328122 **mE** 6571915 **mN**

Described by: JW
Date: 16/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite

No photo available

Vegetation: *Eucalyptus salmonophloia low woodland over Eremophila interstans subsp. interstans mid sparse shrubland over Atriplex vesicaria and Atriplex sp. low open chenopod shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex sp.	35	5	
Atriplex vesicaria	100	20	
Eremophila interstans subsp. interstans	120	5	
Eucalyptus salmonophloia	1000	15	
Maireana georgei	15	0.1	
Salsola australis	5	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q20
Location MGA 50 324559 **mE** 6569671 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: QUADRAT

Landform: Upper slope
Rock Type: Ironstone

Vegetation: *Eucalyptus salmonophloia and Eucalyptus salubris mid open woodland over Eremophila interstans subsp. interstans and Eremophila oldfieldii subsp. angustifolia tall sparse shrubland over Senna artemisioides subsp. filifolia and Atriplex nummularia subsp. spathulata mid sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	25	0.1	
Atriplex nummularia subsp. spathulata	120	0.5	
Dodonaea lobulata	60	0.1	
Eremophila glabra subsp. glabra	90	0.1	
Eremophila interstans subsp. interstans	350	3	
Eremophila oldfieldii subsp. angustifolia	250	1	
Eucalyptus salmonophloia	1200	3	
Eucalyptus salubris	1100	2	
Maireana ?georgei	15	0.1	
Maireana pentatropis	25	0.1	
Maireana sedifolia	100	0.5	
Maireana trichoptera	15	0.1	
Olearia muelleri	30	0.1	
Ptilotus obovatus var. obovatus	15	0.1	
Scaevola spinescens	30	0.1	
Sclerolaena fusiformis	15	0.1	
Senna artemisioides subsp. filifolia	130	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q21
Location MGA 50 327523 **mE** 6573455 **mN**

Described by: JW
Date: 16/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila oldfieldii subsp. angustifolia and Eremophila interstans subsp. interstans tall open shrubland over Senna artemisioides subsp. filifolia and Dodonaea stenozyga mid sparse shrubland*

Condition: Good **Disturbance Type:** Vehicle tracks,Litter

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Dodonaea stenozyga	120	2	
Eremophila interstans subsp. interstans	220	5	
Eremophila oldfieldii subsp. angustifolia	290	10	
Eucalyptus griffithsii	500	1	
Maireana ?marginata	30	2	
Maireana georgei	15	1	
Olearia muelleri	25	1	
Ptilotus obovatus var. obovatus	30	10	
Senna artemisioides subsp. filifolia	120	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q22
Location MGA 50 324398 **mE** 6569324 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Ironstone

Vegetation: *Acacia collegialis and Eremophila oldfieldii subsp. angustifolia tall open shrubland over Ptilotus obovatus var. obovatus and *Salvia verbenaca low herbland*

Condition: Good **Disturbance Type:** Grazing,Litter,Fauna tracks/scats,Historical Clearing

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia collegialis	400	8	
Enchylaena tomentosa var. tomentosa	40	0.1	
Enneapogon caerulescens	4	0.1	
Eremophila oldfieldii subsp. angustifolia	350	4	
Hibiscus sturtii var. grandiflorus	15	0.1	
Maireana trichoptera	20	0.1	
Ptilotus obovatus var. obovatus	35	35	
**Salvia verbenaca*	30	0.5	
Sclerolaena fusiformis	15	0.1	
Sida petrophila	30	4	
Solanum cleistogamum	10	0.1	
Solanum lasiophyllum	25	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q23
Location MGA 50 327250 **mE** 6573660 **mN**

Described by: JW
Date: 16/11/2021
Type: QUADRAT

Landform: Mud slope scree
Rock Type: Laterite

Vegetation: *Eucalyptus torquata low open woodland over Eremophila oldfieldii subsp. angustifolia and Acacia tetragonophylla tall open shrubland over Dodonaea stenozyga, Senna artemisioides subsp. filifolia and Alyxia buxifolia mid shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia tetragonophylla	250	1	
Alyxia buxifolia	130	1	
Dodonaea stenozyga	190	45	
Eremophila oldfieldii subsp. angustifolia	250	15	
Eucalyptus torquata	900	5	
Senna artemisioides subsp. filifolia	170	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q24
Location MGA 50 324535 **mE** 6569030 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Calcrete,Ironstone

Vegetation: *Eucalyptus salmonophloia mid open woodland over Atriplex nummularia subsp. spathulata low sparse chenopod shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	15	0.1	
Atriplex nummularia subsp. spathulata	90	5	
Eucalyptus salmonophloia	1200	6	
Maireana pentatropis	20	0.1	
Maireana trichoptera	10	0.1	
Senna artemisioides subsp. filifolia	50	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q25
Location MGA 50 326779 **mE** 6572716 **mN**

Described by: JW
Date: 16/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite,Limestone,Quartz

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila glabra subsp. glabra, Atriplex vesicaria and Maireana georgei low shrubland over Osteocarpum salsuginosum low sparse herbland*

Condition: Poor,Very Poor **Disturbance Type:** Weeds,Vehicle tracks,Litter,Historical Clearing,Infrastructure

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?holocarpa	35	5	
Atriplex vesicaria	38	15	
Enneapogon caerulescens	5	0.1	
Eremophila glabra subsp. glabra	35	30	
Eucalyptus griffithsii	400	2	
Maireana georgei	20	15	
Maireana pentatropis	25	1	
Maireana tomentosa	20	5	
Osteocarpum salsuginosum	15	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q26
Location MGA 50 325151 **mE** 6568826 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: QUADRAT

Landform: Undulating plain
Rock Type: Ironstone

Vegetation: *Eucalyptus salmonophloia and Eucalyptus salubris mid woodland over Senna artemisioides subsp. filifolia mid isolated shrubs over Atriplex ?vesicaria low isolated chenopod shrubs*

Condition: Very Good **Disturbance Type:** Historical Clearing

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	40	0.5	
Dodonaea lobulata	50	0.1	
Eremophila parvifolia subsp. auricampi	40	0.1	
Eucalyptus salmonophloia	1200	15	
Eucalyptus salubris	1100	5	
Senna artemisioides subsp. filifolia	120	0.5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q27
Location MGA 50 326933 **mE** 6578601 **mN**

Described by: JW
Date: 17/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite,Quartz

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila oldfieldii subsp. angustifolia mid open shrubland over Dodonaea stenozyga, Eremophila glabra subsp. glabra and Santalum spicatum mid open shrubland over Atriplex vesicaria, Exocarpos aphyllus and Pittosporum angustifolium low sparse shrubland*

Condition: Good **Disturbance Type:** Vehicle tracks

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	42	0.5	
Atriplex vesicaria	60	5	
Dodonaea stenozyga	200	20	
Eremophila glabra subsp. glabra	110	1	
Eremophila oldfieldii subsp. angustifolia	250	20	
Eucalyptus griffithsii	500	1	
Exocarpos aphyllus	100	1	
Lycium australe	40	0.5	
Maireana georgei	20	0.5	
Pittosporum angustifolium	60	1	
Ptilotus obovatus var. obovatus	30	2	
Santalum spicatum	170	1	
Senna artemisioides subsp. filifolia	40	0.5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q28
Location MGA 50 325835 **mE** 6569465 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: QUADRAT

Landform: Drainage line
Rock Type: Ironstone

Vegetation: *Eucalyptus salubris mid open forest over Eremophila interstans subsp. interstans tall sparse shrubland over Atriplex nummularia subsp. spathulata mid sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	100	2	
Atriplex nummularia subsp. spathulata	120	2	
Dodonaea lobulata	200	0.1	
Eremophila interstans subsp. interstans	300	4	
Eremophila parvifolia subsp. auricampi	50	0.1	
Eucalyptus salubris	1100	35	
Maireana trichoptera	50	0.1	
Olearia muelleri	90	0.1	
Ptilotus obovatus var. obovatus	40	0.1	
Scaevola spinescens	80	0.1	
Sclerolaena diacantha	10	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q29
Location MGA 50 326944 **mE** 6579386 **mN**

Described by: JW
Date: 17/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Dolerite,Laterite,Quartz

No photo available

Vegetation: *Eucalyptus griffithsii low open woodland over Acacia hemiteles, Dodonaea stenozyga and Santalum spicatum mid shrubland over Atriplex vesicaria, Senna artemisioides subsp. filifolia and Olearia muelleri low open shrubland*
Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia hemiteles	140	15	
Alyxia buxifolia	35	1	
Atriplex vesicaria	70	5	
Dodonaea stenozyga	120	15	
Eucalyptus griffithsii	700	10	
Olearia muelleri	15	2	
Santalum spicatum	200	5	
Senna artemisioides subsp. filifolia	45	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q31
Location MGA 50 326956 **mE** 6579776 **mN**

Described by: JW
Date: 17/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite

No photo available

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila interstans subsp. interstans tall shrubland over Eremophila oppositifolia subsp. angustifolia, Exocarpos aphyllus and Eremophila glabra subsp. glabra mid sparse shrubland*
Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Abutilon cryptopetalum	38	0.1	
Acacia erinacea	40	0.5	
Acacia jennerae	50	5	
Alyxia buxifolia	40	15	
Dodonaea stenozyga	35	1	
Eremophila glabra subsp. glabra	110	0.5	
Eremophila interstans subsp. interstans	220	45	
Eremophila oppositifolia subsp. angustifolia	200	1	
Eremophila scoparia	48	0.1	
Eucalyptus griffithsii	500	5	
Exocarpos aphyllus	110	1	
Maireana trichoptera	10	0.1	
Olearia muelleri	20	0.5	
Senna artemisioides subsp. filifolia	35	0.5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q32
Location MGA 50 325641 **mE** 6569459 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Laterite,Quartz

Vegetation: *Eucalyptus websteriana subsp. websteriana low open woodland over Acacia collegialis tall open shrubland over Dodonaea lobulata low open shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia collegialis	450	11	
Austrostipa trichophylla	5	0.1	
Cheilanthes lasiophylla	5	0.1	
Cheilanthes sieberi subsp. sieberi	8	0.1	
Chrysocephalum puteale	10	0.1	
Dodonaea lobulata	100	13	
Enneapogon caerulescens	3	0.1	
Eremophila alternifolia	30	0.1	
Eremophila oldfieldii subsp. angustifolia	20	0.1	
Eucalyptus websteriana subsp. websteriana	300	1	
**Euphorbia drummondii*	5	0.1	
Goodenia havilandii	10	0.1	
Maireana trichoptera	10	0.1	
Olearia muelleri	35	0.1	
Ptilotus obovatus var. obovatus	20	1	
Scaevola spinescens	50	0.1	
Sida ?petrophila	10	0.1	
Solanum lasiophyllum	10	0.1	
Waitzia acuminata var. acuminata	10	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q33
Location MGA 50 324395 **mE** 6579552 **mN**

Described by: JW
Date: 17/11/2021
Type: QUADRAT

Landform: Ridge
Rock Type: Laterite

Vegetation: *Acacia collegialis tall open shrubland over Eremophila oldfieldii subsp. angustifolia mid sparse shrubland over Dodonaea stenozyga and Solanum lasiophyllum low open shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia collegialis	400	21	
Aristida contorta	5	0.1	
Dodonaea stenozyga	50	20	
Eremophila oldfieldii subsp. angustifolia	120	10	
Goodenia havilandii	15	0.1	
Solanum lasiophyllum	15	0.5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q34
Location MGA 50 325544 **mE** 6569645 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Laterite

Vegetation: *Eucalyptus oleosa subsp. oleosa low isolated trees over Acacia acuminata and Acacia collegialis tall open shrubland over Dodonaea lobulata and Eremophila georgei mid open shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	450	10	
Acacia collegialis	450	3	
Cheilanthes sieberi subsp. sieberi	5	0.1	
Dodonaea lobulata	120	11	
Eremophila georgei	120	1	
Eucalyptus oleosa subsp. oleosa	500	0.5	
Leichhardtia australis	300	0.1	
Ptilotus obovatus var. obovatus	15	0.1	
Senna artemisioides subsp. filifolia	130	0.1	
Solanum lasiophyllum	3	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q35
Location MGA 50 324374 **mE** 6579775 **mN**

Described by: JW
Date: 17/11/2021
Type: QUADRAT

Landform: MId slope
Rock Type: Laterite,Quartz

Vegetation: *Acacia acuminata tall open shrubland over Maireana triptera, Senna artemisioides subsp. filifolia and Dodonaea stenozyga low open shrubland over Ptilotus obovatus var. obovatus and Ptilotus polystachyus low sparse herbland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	400	28	
Cheilanthes lasiophylla	5	0.1	
Dodonaea stenozyga	45	3	
Eremophila glabra subsp. glabra	45	2	
Maireana triptera	25	5	
Ptilotus obovatus var. obovatus	15	1	
Ptilotus polystachyus	35	1	
Senna artemisioides subsp. filifolia	46	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q36
Location MGA 50 324947 **mE** 6578526 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: QUADRAT

Landform: Upper slope
Rock Type: Granite,Laterite

Vegetation: *Eucalyptus clelandiorum and Eucalyptus salmonophloia mid open woodland over Eremophila interstans subsp. interstans tall sparse shrubland over Eremophila parvifolia subsp. auricampi and Atriplex nummularia subsp. spathulata low sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	40	0.1	
Atriplex nummularia subsp. spathulata	80	0.5	
Cratystylis conocephala	40	0.1	
Eremophila interstans subsp. interstans	250	3	
Eremophila parvifolia subsp. auricampi	100	1	
Eucalyptus clelandiorum	1100	3	
Eucalyptus salmonophloia	1100	2	
Exocarpos aphyllus	100	0.1	
Maireana trichoptera	10	0.1	
Roepera ovata	5	0.1	
Scaevola spinescens	50	0.1	
Senna artemisioides subsp. filifolia	160	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q37
Location MGA 50 323658 **mE** 6579927 **mN**

Described by: JW
Date: 17/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite,Quartz

Vegetation: *Eucalyptus salmonophloia and Eucalyptus oleosa subsp. oleosa mid woodland over Eremophila interstans subsp. interstans and Atriplex ?vesicaria mid shrubland over Senna artemisioides subsp. filifolia, Chenopodium curvispicatum and Olearia muelleri low open shrubland*

Condition: Good **Disturbance Type:** Vehicle tracks

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	140	15	
Chenopodium curvispicatum	45	2	
Eremophila interstans subsp. interstans	200	25	
Eucalyptus oleosa subsp. oleosa	1300	2	
Eucalyptus salmonophloia	1500	15	
Maireana pentatropis	15	0.1	
Maireana sedifolia	45	1	
Olearia muelleri	35	2	
Senna artemisioides subsp. filifolia	35	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q38
Location MGA 50 324822 **mE** 6578130 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Laterite

Vegetation: *Acacia collegialis and Eremophila oldfieldii subsp. angustifolia tall open shrubland over Dodonaea lobulata and Eremophila georgei mid sparse shrubland over Ptilotus obovatus var. obovatus low isolated herbs*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia collegialis	450	20	
Aristida contorta	5	0.1	
Cheilanthes sieberi subsp. sieberi	5	0.1	
Dodonaea lobulata	100	7	
Eremophila georgei	130	0.5	
Eremophila oldfieldii subsp. angustifolia	230	2	
Goodenia havilandii	15	0.1	
Leichhardtia australis	30	0.1	
Ptilotus obovatus var. obovatus	30	0.5	
Santalum acuminatum	300	0.1	
Scaevola spinescens	45	0.1	
Sida ?petrophila	10	0.5	
Solanum lasiophyllum	10	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q39
Location MGA 50 323564 **mE** 6579153 **mN**

Described by: JW
Date: 17/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Ironstone,Laterite,Quartz

Vegetation: *Eucalyptus celastroides low woodland over Eremophila interstans subsp. interstans mid sparse shrubland over Maireana pentatropis, Atriplex vesicaria and Chenopodium curvispicatum low sparse chenopod shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex vesicaria	100	2	
Chenopodium curvispicatum	35	1	
Eremophila interstans subsp. interstans	120	10	
Eucalyptus celastroides	600	20	
Maireana pentatropis	25	5	
Olearia muelleri	35	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q40
Location MGA 50 324436 **mE** 6578315 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Laterite,Quartz

Vegetation: *Acacia collegialis tall open shrubland over Dodonaea lobulata and Eremophila georgei mid open shrubland over Ptilotus obovatus var. obovatus low isolated herbs*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia collegialis	450	15	
Acacia tetragonophylla	210	0.1	
Aristida contorta	10	0.1	
Cheilanthes lasiophylla	5	0.1	
Cheilanthes sieberi subsp. sieberi	8	0.1	
Dodonaea lobulata	170	10	
Eremophila georgei	140	3	
Eremophila oldfieldii subsp. angustifolia	50	0.1	
Goodenia havilandii	15	0.1	
Leichhardtia australis	10	0.1	
Ptilotus obovatus var. obovatus	15	0.5	
Santalum acuminatum	270	0.1	
Scaevola spinescens	120	0.1	
Solanum lasiophyllum	5	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q41
Location MGA 50 323554 **mE** 6579206 **mN**

Described by: JW
Date: 18/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite,Quartz

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila interstans subsp. interstans, Eremophila glabra subsp. glabra and Acacia hemiteles mid open shrubland over Tecticornia halocnemoides, Atriplex sp. and Maireana trichoptera low chenopod shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia hemiteles	160	3	
Atriplex sp.	25	5	
Eremophila glabra subsp. glabra	110	5	
Eremophila interstans subsp. interstans	140	15	
Eucalyptus griffithsii	1000	5	
Exocarpos aphyllus	180	1	
Frankenia ?fecunda	5	0.1	
Maireana trichoptera	20	5	
Senna artemisioides subsp. filifolia	60	2	
Tecticornia halocnemoides	100	25	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q42
Location MGA 50 323685 **mE** 6577907 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: QUADRAT

Landform: Footslope
Rock Type: Ironstone,Quartz

Vegetation: *Eremophila interstans subsp. interstans mid sparse shrubland over Tecticornia halocnemoides low open samphire shrubland*

Condition: Good **Disturbance Type:** Vehicle tracks

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	50	2	
Atriplex nummularia subsp. spathulata	90	1	
Eremophila interstans subsp. interstans	180	2	
Eremophila parvifolia subsp. auricampi	30	0.1	
Exocarpos aphyllus	30	0.1	
Frankenia ?fecunda	20	0.1	
Lawrencia repens	3	0.1	
Maireana trichoptera	10	0.1	
Ptilotus exaltatus	2	0.1	
Rhagodia drummondii	15	0.1	
Roepera ovata	8	0.1	
Sclerolaena fusiformis	5	0.1	
Tecticornia halocnemoides	90	11	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q43
Location MGA 50 323723 **mE** 6578705 **mN**

Described by: JW
Date: 18/11/2021
Type: QUADRAT

Landform: Ridge crwat
Rock Type: Ironstone,Laterite,Quartz

Vegetation: *Eucalyptus celastroides low woodland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eucalyptus celastroides	700	25	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R44
Location MGA 50 323751 **mE** 6577898 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: RELEVE

Landform: Cracking clay No photo available
Rock Type: Ironstone,Quartz

Vegetation: *Streptoglossa liatroides and Sclerolaena cuneata low sparse herbland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Goodenia pinnatifida	5	0.1	
Ptilotus exaltatus	25	0.1	
Sclerolaena cuneata	5	0.5	
Streptoglossa liatroides	2	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q45
Location MGA 50 323830 **mE** 6584592 **mN**

Described by: JW
Date: 18/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Laterite,Quartz

No photo available

Vegetation: *Eremophila oldfieldii subsp. angustifolia tall sparse shrubland over Acacia acuminata and Senna artemisioides subsp. filifolia mid sparse shrubland over Atriplex vesicaria, Maireana pentatropis and Maireana georgei low sparse chenopod shrubland*
Condition: Poor **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	170	5	
Atriplex vesicaria	45	5	
Eremophila oldfieldii subsp. angustifolia	220	5	
Maireana georgei	15	0.5	
Maireana pentatropis	15	2	
Ptilotus exaltatus	25	5	
Ptilotus obovatus var. obovatus	35	1	
Rhodanthe chlorocephala subsp. rosea	5	0.1	
**Salvia verbenaca*	15	0.5	
Senna artemisioides subsp. filifolia	140	1	
Solanum lasiophyllum	20	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q46
Location MGA 50 324398 **mE** 6577581 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Ironstone,Quartz

Vegetation: *Eucalyptus salmonophloia mid open woodland over Eremophila interstans subsp. interstans tall sparse shrubland over Atriplex nummularia subsp. spathulata mid sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	50	2	
Atriplex nummularia subsp. spathulata	160	6	
Eremophila interstans subsp. interstans	250	1	
Eucalyptus salmonophloia	1300	7	
Maireana trichoptera	15	0.1	
Scaevola spinescens	30	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q48
Location MGA 50 324472 **mE** 6578839 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Granite,Ironstone,Quartz

Vegetation: *Eucalyptus salubris low open woodland over Eremophila oldfieldii subsp. angustifolia and Acacia collegialis tall sparse shrubland over Dodonaea lobulata and Senna artemisioides subsp. filifolia mid sparse shrubland*

Condition: Good **Disturbance Type:** Litter,Historical Clearing

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia collegialis	300	2	
Aristida contorta	5	0.1	
Dodonaea lobulata	130	4	
Eremophila oldfieldii subsp. angustifolia	250	4	
Eucalyptus salubris	600	1	
Maireana trichoptera	10	0.1	
Olearia muelleri	40	0.1	
Ptilotus obovatus var. obovatus	15	0.1	
Scaevola spinescens	50	1	
Senna artemisioides subsp. filifolia	150	3	
Trymalium myrtillus subsp. myrtillus	150	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q50
Location MGA 50 325838 **mE** 6579783 **mN**

Described by: BD,SW
Date: 18/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Ironstone,Quartz

Vegetation: *Acacia hemiteles, Casuarina pauper and Eremophila oldfieldii subsp. angustifolia tall sparse shrubland over Senna artemisioides subsp. filifolia, Acacia jennerae and Eremophila deserti mid sparse shrubland over Scaevola spinescens, Chenopodium curvispicatum and Maireana trichoptera low sparse shrubland*

Condition: Good **Disturbance Type:** Vehicle tracks,Fauna tracks/scats,Historical Clearing

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia hemiteles	230	4	
Acacia jennerae	130	2	
Aristida contorta	10	0.1	
Atriplex ?vesicaria	40	0.1	
Atriplex nummularia subsp. spathulata	330	0.1	
Austrostipa platychaeta	150	0.1	
**Carrichtera annua*	15	0.1	
Casuarina pauper	300	1	
Chenopodium curvispicatum	20	0.5	
Eremophila deserti	170	1	
Eremophila oldfieldii subsp. angustifolia	220	1	
Leichhardtia australis	100	0.1	
Maireana sedifolia	160	2	
Maireana tomentosa	5	0.1	
Maireana trichoptera	30	0.5	
Pimelea microcephala subsp. microcephala	190	1	
Pittosporum angustifolium	200	0.1	
Ptilotus obovatus var. obovatus	35	0.1	
Salsola australis	4	0.1	
**Salvia verbenaca*	25	0.1	
Scaevola spinescens	100	3	
Sclerolaena fusiformis	10	0.5	
Senna artemisioides subsp. filifolia	170	3	
Solanum nummularium	35	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q52
Location MGA 50 325464 **mE** 6579380 **mN**

Described by: BD,SW
Date: 18/11/2021
Type: QUADRAT

Landform: Claypan
Rock Type: Calcrete,Ironstone,Quartz

Vegetation: *Dodonaea lobulata and Eremophila interstans subsp. interstans mid sparse shrubland over Maireana trichoptera, Atriplex vesicaria and Maireana georgei low sparse chenopod shrubland over *Salvia verbenaca, Ptilotus exaltatus and Sclerolaena fusiformis low herbland*

Condition: Good **Disturbance Type:** Weeds,Vehicle tracks

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex vesicaria	50	1	
Calandrinia baccata	5	0.1	
**Carrichtera annua*	15	1	
**Centaurea melitensis*	25	0.1	
Chenopodium curvispicatum	30	0.1	
Dodonaea lobulata	150	4	
Dysphania melanocarpa forma leucocarpa	10	0.1	
Eremophila interstans subsp. interstans	180	1	
Lawrencia repens	5	1	
Maireana georgei	20	1	
Maireana trichoptera	40	3	
Monachather paradoxus	5	0.1	
**Oligocarpus calendulaceus*	5	0.1	
Ptilotus exaltatus	35	12	
Ptilotus obovatus var. obovatus	20	0.1	
**Salvia verbenaca*	20	15	
Sclerolaena fusiformis	8	5	
Senna artemisioides subsp. filifolia	150	0.1	
Solanum lasiophyllum	10	0.1	
Streptoglossa liatroides	5	3	
Vittadinia dissecta var. hirta	30	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2Q54
Location MGA 50 324779 **mE** 6583442 **mN**

Described by: BD,SW
Date: 18/11/2021
Type: QUADRAT

Landform: Undulating plain
Rock Type: Ironstone,Laterite

Vegetation: *Eucalyptus salmonophloia low open woodland over Eremophila oldfieldii subsp. angustifolia tall isolated shrubs over Senna artemisioides subsp. filifolia, Eremophila interstans subsp. interstans and Dodonaea lobulata mid open shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia tetragonophylla	170	0.1	
Aristida contorta	15	0.1	
Atriplex nummularia subsp. spathulata	120	0.1	
Dodonaea lobulata	100	2	
Eremophila glabra subsp. glabra	160	1	
Eremophila interstans subsp. interstans	160	3	
Eremophila oldfieldii subsp. angustifolia	250	0.5	
Eremophila parvifolia subsp. auricampi	130	1	
Eucalyptus salmonophloia	900	5	
Leichhardtia australis	150	0.1	
Maireana trichoptera	15	0.1	
Olearia muelleri	30	0.1	
Ptilotus obovatus var. obovatus	30	0.1	
Roepera ovata	5	0.1	
Scaevola spinescens	50	0.1	
Senna artemisioides subsp. filifolia	140	8	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R05
Location MGA 50 327540 **mE** 6571802 **mN**

Described by: JW
Date: 16/11/2021
Type: RELEVE

Landform: Minor creek line
Rock Type: Laterite

No photo available

Vegetation: *Eucalyptus torquata low woodland over Dodonaea stenozyga mid sparse shrubland over Ptilotus obovatus var. obovatus and Haloragis trigonocarpa low sparse herbland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Dodonaea stenozyga	110	5	
Eucalyptus torquata	400	20	
Haloragis trigonocarpa	40	2	
Ptilotus obovatus var. obovatus	25	6	
Senna artemisioides subsp. filifolia	48	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R06
Location MGA 50 327365 **mE** 6572989 **mN**

Described by: JW
Date: 16/11/2021
Type: RELEVE

Landform: Lake
Rock Type: N/A

Vegetation: **Schinus molle var. areira low woodland over Aristida contorta low grassland over *Heliotropium europaeum, Heliotropium curassavicum and *Sonchus asper low herbland*

Condition: Degraded **Disturbance Type:** Weeds,Grazing,Vehicle tracks,Litter,Fauna tracks/scats

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Aristida contorta	30	70	
Heliotropium curassavicum	18	1	
**Heliotropium europaeum*	2	40	
**Schinus molle var. areira*	300	15	
**Sonchus asper*	70	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R07
Location MGA 50 327376 **mE** 6570901 **mN**

Described by: JW
Date: 16/11/2021
Type: RELEVE

Landform: MId slope
Rock Type: Laterite

Vegetation: *Eucalyptus oleosa subsp. oleosa low woodland over Atriplex vesicaria low sparse chenopod shrubland over Heliotropium curassavicum low sparse herbland*

Condition: Good **Disturbance Type:** Vehicle tracks

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex vesicaria	60	10	
Eucalyptus oleosa subsp. oleosa	700	15	
Heliotropium curassavicum	40	10	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R09
Location MGA 50 327166 **mE** 6574087 **mN**

Described by: JW
Date: 16/11/2021
Type: RELEVE

Landform: Plain
Rock Type: Laterite

Vegetation: *Eucalyptus torquata and Eucalyptus griffithsii low woodland over Eremophila oldfieldii subsp. angustifolia and Santalum acuminatum tall open shrubland over Dodonaea stenozyga, Senna artemisioides subsp. filifolia and Alyxia buxifolia low shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Alyxia buxifolia	50	5	
Dodonaea stenozyga	80	25	
Eremophila oldfieldii subsp. angustifolia	300	25	
Eucalyptus griffithsii	800	2	
Eucalyptus torquata	1000	15	
Santalum acuminatum	220	2	
Senna artemisioides subsp. filifolia	90	18	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R11
Location MGA 50 325721 **mE** 6569452 **mN**

Described by: BD,SW
Date: 16/11/2021
Type: RELEVE

Landform: Drainage line
Rock Type: Ironstone

Vegetation: *Eucalyptus salmonophloia mid woodland over Eremophila interstans subsp. interstans and Acacia collegialis tall open shrubland over Senna artemisioides subsp. filifolia and Dodonaea lobulata mid open shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	250	0.1	
Acacia collegialis	300	1	
Dodonaea lobulata	120	2	
Eremophila interstans subsp. interstans	250	20	
Eremophila oldfieldii subsp. angustifolia	250	0.1	
Eremophila parvifolia subsp. auricampi	40	0.1	
Eucalyptus salmonophloia	1200	20	
Olearia muelleri	40	0.1	
Ptilotus obovatus var. obovatus	40	0.1	
Senna artemisioides subsp. filifolia	150	15	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R13
Location MGA 50 324764 **mE** 6579229 **mN**

Described by: BD,SW
Date: 17/11/2021
Type: RELEVE

Landform: Plain
Rock Type: Calcrete,Laterite

No photo available

Vegetation: *Maireana georgei mid sparse chenopod shrubland over Atriplex nummularia subsp. spathulata, Maireana tomentosa and Atriplex ?vesicaria low sparse chenopod shrubland over *Centaurea melitensis and Ptilotus obovatus var. obovatus low open herbland*

Condition: Very Poor **Disturbance Type:** Weeds,Vehicle tracks,Litter,Historical Clearing,Infrastructure

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	25	0.5	
Atriplex nummularia subsp. spathulata	20	1	
Atriplex quadrivalvata	15	0.1	
**Centaurea melitensis*	40	10	
Hibiscus solanifolius	120	0.1	
Maireana georgei	120	2	
Maireana tomentosa	30	1	
Ptilotus obovatus var. obovatus	35	10	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R15
Location MGA 50 324420 **mE** 6579488 **mN**

Described by: JW
Date: 17/11/2021
Type: RELEVE

Landform: Ridge crwst
Rock Type: Laterite,Quartz

Vegetation: *Eucalyptus campaspe and Eucalyptus oleosa subsp. oleosa low open forest over Senna artemisioides subsp. filifolia mid open shrubland over Olearia muelleri and Eremophila glabra subsp. glabra low open shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eremophila glabra subsp. glabra	90	1	
Eucalyptus campaspe	1000	25	
Eucalyptus oleosa subsp. oleosa	1000	15	
Olearia muelleri	28	10	
Senna artemisioides subsp. filifolia	200	18	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C2R17
Location MGA 50 323480 **mE** 6579368 **mN**

Described by: JW
Date: 17/11/2021
Type: RELEVE

Landform: Plain
Rock Type: Ironstone,Laterite

Vegetation: *Eucalyptus oleosa subsp. oleosa and Eucalyptus celastroides low woodland over Senna artemisioides subsp. filifolia and Eremophila interstans subsp. interstans low sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Eremophila interstans subsp. interstans	35	0.5	
Eucalyptus celastroides	500	1	
Eucalyptus oleosa subsp. oleosa	700	10	
Olearia muelleri	25	0.1	
Senna artemisioides subsp. filifolia	60	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C3Q01
Location MGA 50 328133 **mE** 6574120 **mN**

Described by: JW
Date: 18/11/2021
Type: QUADRAT

Landform: Plai
Rock Type: Laterite

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila interstans subsp. interstans, Senna artemisioides subsp. filifolia and Acacia jennerae mid open shrubland over Alyxia buxifolia, Westringia rigida and Olearia muelleri low sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	120	1	
Acacia jennerae	140	1	
Alyxia buxifolia	90	2	
Eremophila interstans subsp. interstans	130	5	
Eucalyptus griffithsii	700	5	
Exocarpos aphyllus	150	1	
Maireana tomentosa	10	0.1	
Olearia muelleri	28	0.5	
Ptilotus exaltatus	15	0.1	
Senna artemisioides subsp. filifolia	120	5	
Westringia rigida	45	2	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C3Q02
Location MGA 50 328109 **mE** 6573080 **mN**

Described by: BD,SW
Date: 18/11/2021
Type: QUADRAT

Landform: Upper slope
Rock Type: Granite,Laterite

Vegetation: *Eucalyptus torquata low open forest over Dodonaea stenozyga low sparse shrubland*

Condition: Good **Disturbance Type:** Litter

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
?Enchylaena tomentosa	20	0.1	
Atriplex ?vesicaria	40	0.1	
Dodonaea lobulata	90	0.1	
Dodonaea stenozyga	80	3	
Eremophila interstans subsp. interstans	180	0.1	
Eremophila parvifolia subsp. auricampi	60	0.1	
Eucalyptus torquata	800	35	
Exocarpos aphyllus	40	0.1	
Maireana trichoptera	10	0.1	
Ptilotus obovatus var. obovatus	10	0.1	
Rytidosperma sp.	10	0.1	
Scaevola spinescens	50	0.1	
Solanum nummularium	5	0.1	
Trymalium myrtillus subsp. myrtillus	20	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C3Q02A
Location MGA 50 327861 **mE** 6573908 **mN**

Described by: JW
Date: 18/11/2021
Type: QUADRAT

Landform: Hill top
Rock Type: Granite,Ironstone,Laterite

Vegetation: *Eucalyptus torquata low open woodland over Dodonaea stenozyga, Acacia acuminata and Eremophila oldfieldii subsp. angustifolia mid open shrubland over Alyxia buxifolia and Senna artemisioides subsp. filifolia low sparse shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia acuminata	200	3	
Acacia dissona var. dissona	200	1	
Alyxia buxifolia	50	1	
Dodonaea stenozyga	110	12	
Eremophila oldfieldii subsp. angustifolia	150	3	
Eucalyptus torquata	1000	5	
Maireana georgei	5	0.1	
Senna artemisioides subsp. filifolia	70	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C3Q02B
Location MGA 50 327412 **mE** 6574092 **mN**

Described by: JW
Date: 18/11/2021
Type: QUADRAT

Landform: Plain
Rock Type: Ironstone,Laterite

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila oldfieldii subsp. angustifolia mid sparse shrubland over Atriplex vesicaria, Dodonaea stenozyga and Acacia dissona var. dissona low open shrubland*

Condition: Very Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Acacia dissona var. dissona	25	1	
Acacia hemiteles	100	1	
Atriplex vesicaria	45	15	
Dodonaea stenozyga	25	5	
Eremophila interstans subsp. interstans	25	1	
Eremophila oldfieldii subsp. angustifolia	150	5	
Eucalyptus griffithsii	700	5	
Maireana pentatropis	15	0.1	
Maireana tomentosa	10	0.5	
Olearia muelleri	25	1	
Ptilotus obovatus var. obovatus	15	1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C3Q06
Location MGA 50 327864 **mE** 6573343 **mN**

Described by: BD,SW
Date: 18/11/2021
Type: QUADRAT

Landform: Mid slope
Rock Type: Calcrete,Laterite

Vegetation: *Eucalyptus torquata low woodland over Eremophila interstans subsp. interstans tall sparse shrubland over Dodonaea stenozyga mid sparse shrubland*

Condition: Good **Disturbance Type:** Vehicle tracks,Fauna tracks/scats

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Atriplex ?vesicaria	50	0.1	
Atriplex nummularia subsp. spathulata	40	0.1	
Austrostipa platychaeta	80	0.1	
Dodonaea stenozyga	150	1	
Eremophila interstans subsp. interstans	370	1	
Eremophila parvifolia subsp. auricampi	30	0.1	
Eucalyptus torquata	800	15	
Maireana sedifolia	120	0.1	
Maireana tomentosa	5	0.1	
Maireana trichoptera	15	0.1	
Olearia muelleri	40	0.1	
Senna artemisioides subsp. filifolia	60	0.1	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C3R01
Location MGA 50 328239 **mE** 6574703 **mN**

Described by: JW
Date: 18/11/2021
Type: RELEVE

Landform: Plain
Rock Type: Laterite

Vegetation: *Eucalyptus griffithsii low open woodland over Eremophila interstans subsp. interstans tall open shrubland over Atriplex vesicaria and Exocarpos aphyllus mid open shrubland*

Condition: Good **Disturbance Type:** None

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
Alyxia buxifolia	90	1	
Atriplex vesicaria	110	15	
Dianella revoluta var. divaricata	60	0.5	
Dodonaea stenozyga	15	0.5	
Eremophila glabra subsp. glabra	70	2	
Eremophila interstans subsp. interstans	220	15	
Eucalyptus griffithsii	1000	5	
Exocarpos aphyllus	130	5	
Maireana pentatropis	15	0.5	
Maireana trichoptera	20	0.1	
Olearia muelleri	15	0.5	
Pimelea spiculigera var. thesioides	20	0.1	
Ptilotus exaltatus	35	5	

FLORA SITE SHEET

Project Name 4794 Coolgardie Biological Survey
Site: C3R04
Location MGA 50 328218 **mE** 6573560 **mN**

Described by: BD,SW
Date: 18/11/2021
Type: RELEVE

Landform: Creek line
Rock Type: Granite,Quartz

Vegetation: *Eucalyptus salmonophloia mid open forest over Eremophila interstans subsp. interstans tall sparse shrubland over Acacia jennerae mid sparse shrubland*

Condition: Good **Disturbance Type:** Weeds,Vehicle tracks

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
?Pimelea sp.	170	0.1	
Acacia jennerae	150	5	
**Asphodelus fistulosus*	30	0.1	
Atriplex ?vesicaria	30	2	
Atriplex nummularia subsp. spathulata	50	1	
**Carrichtera annua*	20	0.1	
**Centaurea melitensis*	20	0.1	
Chloris truncata	30	0.1	
Eragrostis dielsii	3	0.1	
Eremophila interstans subsp. interstans	210	4	
Eremophila oldfieldii subsp. angustifolia	140	0.1	
Eucalyptus salmonophloia	1100	40	
Maireana trichoptera	20	0.1	
Olearia muelleri	40	0.1	
**Oligocarpus calendulaceus*	5	0.1	
Pittosporum angustifolium	210	0.1	
Ptilotus exaltatus	30	0.1	
Ptilotus obovatus var. obovatus	25	0.1	
Sclerolaena diacantha	5	0.1	
Senna artemisioides subsp. filifolia	120	0.1	
Vittadinia dissecta var. hirta	15	0.1	

Appendix F
Fauna Habitat Assessments

HABC01

Project:	4794 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	899984.8973525156	**Northing**	6572010.013459269
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	5 - 25%
Condition			
Quality	Good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Low (<10 m)	Open forest (50-80%)	*Acacia sp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*dodonaea sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*ptilotus sp.*

Fulcrum photo ID	42151a58-0510-40c7-b5b8-39f62d4c1f75,4ffc3568-888a-4c64-9f70-

HABC02

Project:	4795 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	899822.8621105128	**Northing**	6571973.766455285
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	25 - 50%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Acacia sp.*
Mid stratum	Mid (1-2 m)	Open mallee shrubland (20-50%)	
Ground stratum	Low (>0.5 m)	Open forbland (20-50%)	*ptilotus sp.*

Fulcrum photo ID	687a6808-3ad9-4430-9631-687bd7c191ca,3a9bdcb2-3829-4fc9-b373-

HABC03

Project:	4796 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	899951.8547312932	**Northing**	6571730.697303254
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Quartz
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown	**Surface stone size classes present**	0 - 5%
Condition			
Quality	Good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Hollows - trees,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*eucalyptus mallee*
Ground stratum	Low (>0.5 m)	Open forbland (20-50%)	*eremophila sp, salt Bush, acacia sp.*

Fulcrum photo ID	cae7ef5d-35d9-43c9-bff0-76d8079f5710,e1c8ac9f-dd84-4e1b-a0b8-

HABC04

Project:	4797 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	899917.5832372475	**Northing**	6571665.113011075
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Granite,Quartz
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	5 - 25%
Condition			
Quality	Good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Peeling bark,Rock crevices,Woody debris
Introduced fauna	Cattle		

Vegetation			
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	*Eremophila sp.*
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*ptilotus sp.*

Fulcrum photo ID	5e27f824-34b2-4807-bc1c-60a160cc8ad3,d582a71f-1bea-4caa-99e9-

HABC05

Project:	4798 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	900074.8952529589	**Northing**	6571739.672393914
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	0 - 5%
Condition			
Quality	Good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks,Weeds	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Forbland (50-80%)	*saltbush sp.*

Fulcrum photo ID	e29ce514-0173-433b-bb49-ef3ded5af200,1db3699d-1b8b-4cf9-950a-

HABC06

Project:	4799 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	900594.4049126134	**Northing**	6571695.699349251
Landform and soil		**Rock**	
Landform	Gorge	**Rock type/s**	Granite
Soil type	Clay	**Surface stone cover**	
Soil colour	Brown	**Surface stone size classes present**	0 - 5%
Condition			
Quality	Highly degraded	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Present
Disturbance	Clearing,Litter,Vehicle tracks	**Microhabitats**	Exfoliating rock
Introduced fauna	Goat		

Vegetation			
Upper stratum	Absent		
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Sparse tussock grassland (0.25-20%)	*eraharta sp.*

Fulcrum photo ID	7c25ab6a-4d43-4390-897a-cb707b353f57,7ba253fb-c9d3-4b40-885f-

HABC07

Project:	4800 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	901166.9975909423	**Northing**	6571815.560922004
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Granite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Burrows,Leaf litter,Peeling bark,Woody debris
Introduced fauna	Cattle,Rabbit		

Vegetation			
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	*Eucalyptus sp. and eremophila sp.*
Mid stratum	Low (0.5-1 m)	Shrubland and/or heathland (50-80%)	*dodonaea*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*saltbush and Ptilotus sp.*

Fulcrum photo ID	0103efbf-c7eb-4e3f-bb46-943ea4911830,ccb4b5f6-49b0-4d03-8017-

HABC08

Project:	4801 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	901301.0032407076	**Northing**	6571962.571508318
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Granite
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Grey,Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	Cattle		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*saltbush sp.*

Fulcrum photo ID	212d5260-a83c-4619-b069-494f4f980745,0b6d6cef-7222-4fa8-9bcc-

HABC09

Project:	4802 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	901682.8518081398	**Northing**	6571863.583170791
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Sandy clay	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Absent		

Fulcrum photo ID	117fc066-1e33-488f-b006-63d6e0f432e1,e1f0326e-d28b-470e-b3ef-

HABC10

Project:	4803 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	902022.5631623187	**Northing**	6572062.188234046
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Granite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Red	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*acacia sp. eremophila sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	

Fulcrum photo ID	b36a6fd3-4521-41ec-ba74-6fdeac4098bb,0044da98-5d6a-4f2e-9cba-

HABC11

Project:	4804 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	902400.9875870193	**Northing**	6571798.486756262
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Calcrete,Granite
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	Goat,Rabbit		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*eremophila sp. dodenea sp. acacia sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*eremophila*

Fulcrum photo ID	3c1c6583-ed7c-459a-93f5-8dd769a4d26c,4211c7c8-571a-4138-af6c-

HABC12

Project:	4805 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	902370.029827407	**Northing**	6571589.932107501
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Unknown
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	0 - 5%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	

Fulcrum photo ID	aef600dc-722f-4dd1-a355-599e69a6b123,e75ca763-a192-495f-a373-

HABC13

Project:	4806 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	900730.9056804918	**Northing**	6570131.034563001
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Granite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Red	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance		**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	Goat,Rabbit		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Acacia sp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*dodonaea sp.*
Ground stratum	Low (>0.5 m)	Isolated tussock grasses (<0.25%)	*grass species*

Fulcrum photo ID	58005a12-2165-49c3-b705-24e2a50985e8,0b2d1291-65d4-48da-b5d6

HABC14

Project:	4807 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	900889.8561838119	**Northing**	6569940.604672145
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Grey	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp. salt bush*
Ground stratum	Mid (0.5-1 m)	Open forbland (20-50%)	*salt bush sp.*

Fulcrum photo ID	3b56a64c-51c9-4e00-bdc1-f54d4301f218,c0fddb0c-66e8-40b3-9c48-

HABC15

Project:	4808 Coolgardie Biological Spring Survey		
Date	2021-10-12	**Personnel**	LC
Easting	901542.5074801195	**Northing**	6568846.8061696505
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Calcrete,Granite
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Red	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*acacia sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*ptilotus sp*

Fulcrum photo ID	bfb61e82-be29-4f8f-a414-761f945af8e4,e6e2629f-1f45-4bcd-9213-

HABC16

Project:	4809 Coolgardie Biological Spring Survey		
Date	2021-10-13	**Personnel**	LC
Easting	902295.8342707243	**Northing**	6571439.575077539
Landform and soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Erosion	**Microhabitats**	Hollows - trees,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*Saltbush sp.*

Fulcrum photo ID	b70c7eb9-827e-46df-b8e4-5e4e110d293a,85f73721-6a97-4980-94c7-

HABC17

Project:	4810 Coolgardie Biological Spring Survey		
Date	2021-10-13	**Personnel**	LC
Easting	901495.8347967644	**Northing**	6571719.769933704
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Orange,Yellow	**Surface stone size classes present**	0 - 5%
Condition			
Quality	Good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Burrows,Hollows - logs,Hollows - trees,Leaf litter,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*ptilotus sp. and herb sp.*

Fulcrum photo ID	372a2bcc-d839-41ff-9db2-d990a2431994,cd2c96ca-6b1d-49e3-b273-

HABC18

Project:	4811 Coolgardie Biological Spring Survey		
Date	2021-10-13	**Personnel**	LC
Easting	899905.7739034619	**Northing**	6571300.257774439
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange,Red	**Surface stone size classes present**	25 - 50%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Isolated trees (<0.25%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*dodenea sp. eremophila sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*ptilotus sp.*

Fulcrum photo ID	3663874c-d46e-438f-8c20-f9744960ca60,30a5a95b-d86a-4c39-8c3b-

HABC19

Project:	4812 Coolgardie Biological Spring Survey		
Date	2021-10-13	**Personnel**	LC
Easting	899738.7645235118	**Northing**	6571320.002878793
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Granite,Quartz
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*saltbush sp. and Ptilotus sp.*

Fulcrum photo ID	3996f487-e2d9-4d38-9be8-65219fc9ea13,d5e4af84-5d54-464a-b161-

HABC20

Project:	4813 Coolgardie Biological Spring Survey		
Date	2021-10-14	**Personnel**	LC
Easting	900350.4372829349	**Northing**	6571342.937353729
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Grey	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Erosion,Litter,Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*saltbush sp. and herb sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*saltbush sp.*

Fulcrum photo ID	cfd77415-c024-4198-bd3a-e011a5fb5404,15466c44-d7ac-4902-a088-

HABC21

Project:	4814 Coolgardie Biological Spring Survey		
Date	2021-10-14	**Personnel**	LC
Easting	900421.5213021053	**Northing**	6571645.335509442
Landform and soil		**Rock**	
Landform	Claypan	**Rock type/s**	Granite
Soil type	Clay	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Highly degraded		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Clearing,Erosion,Litter,Overgrazing,Vehicle	**Microhabitats**	Rock crevices,Woody debris
Introduced fauna	Cattle		

Vegetation			
Upper stratum	Mid (10-30 m)	Isolated trees (<0.25%)	*Eucalyptus sp.*
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Tussock grassland (50-80%)	*grass sp. and thistle sp. sedges boemia sp.*

Fulcrum photo ID	bfe042ed-7948-4c78-9fe1-7c8541220392,7696b9b4-9eeb-4df8-8e63-

HABC22

Project:	4815 Coolgardie Biological Spring Survey		
Date	2021-10-14	**Personnel**	LC
Easting	900235.352356134	**Northing**	6572033.776216977
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange,Red	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Clearing,Litter,Vehicle tracks,Weeds	**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Woodland (20-50%)	*Acacia sp.*
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	*dodenea sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*ptilotus sp. herbs*

Fulcrum photo ID	51a9f868-dbfc-4d0d-aa65-cebf271c9d24,bcb04dd4-53d3-407a-9ce9-

HABC23

Project:	4816 Coolgardie Biological Spring Survey		
Date	2021-10-14	**Personnel**	LC
Easting	900167.7359049395	**Northing**	6570928.550377593
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Grey,Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Highly degraded		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Clearing,Litter,Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*saltbush cena sp. herbs sp.*

Fulcrum photo ID	4e1b0f41-0592-423d-8408-a19672a9d5c6,f06cb18e-09e9-41d6-a61b-

HABC24

Project:	4817 Coolgardie Biological Spring Survey		
Date	2021-10-14	**Personnel**	LC
Easting	899663.2610756675	**Northing**	6571226.542719762
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Isolated trees (<0.25%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*eremophila sp. dodenea sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*ptilotus sp. salt bush sp.*

Fulcrum photo ID	8f123c2e-9663-4712-845a-fe15deec853c,26ed00e2-46e6-4415-ad80-

C2H2

Project:	4818 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	SW
Easting	897743.7674614477	**Northing**	6565685.35287808
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia and Melaleuca sp*
Ground stratum	Low (>0.5 m)	Isolated hummock grasses (<0.25%)	*Scaveloa spin*

Fulcrum photo ID	c4cad0bd-4f57-4209-9459-7401a6a867d2

C2H4

Project:	4819 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	SW
Easting	897738.8708299723	**Northing**	6565557.982810425
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	75 - 100%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Melaleuca sp*
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	*Scaveloa spin*

Fulcrum photo ID	a0f87fb2-1a73-43d5-bfb4-bf7e2ce804a4

C2H6

Project:	4820 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	SW
Easting	897718.2217606371	**Northing**	6565454.049011737
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	75 - 100%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance		**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Isolated trees (<0.25%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Eucalyptus sp*
Ground stratum	Low (>0.5 m)		

Fulcrum photo ID	a25ac42a-b0be-4c30-a8b2-8e07a2f5bcd9

C2H8

Project:	4821 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	SW
Easting	897820.0346483674	**Northing**	6565227.984386012
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Isolated trees (<0.25%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Eremophila sp*
Ground stratum			

Fulcrum photo ID	93421722-1ad4-4c10-9e11-de2ef1902d8b

C2H10

Project:	4822 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	SW
Easting	898008.8963851782	**Northing**	6565265.629842697
Landform and soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Calcrete,Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange,Red	**Surface stone size classes present**	25 - 50%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Unknown	**Water Source**	Absent
Disturbance	Erosion	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Eremophila*
Ground stratum			

Fulcrum photo ID	45de2c23-38f7-401c-8d48-42e59fe7b842

C2H12

Project:	4823 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	SW
Easting	898183.4047518701	**Northing**	6565240.394553069
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition			
Quality	Good	**Habitat Features**	
Fire History	Unknown	**Water Source**	Absent
Disturbance	Erosion	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Low (0.5-1 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*Senna art fil*
Ground stratum			

Fulcrum photo ID	08469bcc-a34b-4b23-bf34-76982cd97e9c

HABC2LC01

Project:	4824 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	LC
Easting	899664.2211246493	**Northing**	6565980.506265143
Landform and soil		**Rock**	
Landform	Gorge	**Rock type/s**	Granite,Quartz
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Yellow	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Highly degraded		
Fire History	Unknown	**Water Source**	Absent
Disturbance		**Microhabitats**	Exfoliating rock,Rock crevices
Introduced fauna	None observed		

Vegetation

Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*eremophila sp. salt bush sp.*

Fulcrum photo ID	4ebf3251-d69c-4d7e-93c5-260eba7ae549,d2ea3ab1-5502-453c-9997-

HABC2LC02

Project:	4825 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	LC
Easting	899850.8139667105	**Northing**	6565706.821050039
Landform and soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Granite,Quartz
Soil type	Sandy clay	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance		**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	Goat		

Vegetation

Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*eremophila sp.*

Fulcrum photo ID	4b2247e7-9fed-441d-b103-59e6bf65756c,a6bfbb91-71be-4e28-992d-

HABC2LC03

Project:	4826 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	LC
Easting	900665.7028282916	**Northing**	6565871.541426335
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Sandy clay	**Surface stone cover**	
Soil colour	Orange,Red	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Low (<10 m)	Open forest (50-80%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Mid (0.5-1 m)	Sparse forbland (0.25-20%)	*eremophila sp.*

Fulcrum photo ID	b0752528-0a49-4733-a884-d5b48bd2d627,ce6b6969-95db-4c53-bfdd-

HABC2LC04

Project:	4827 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	LC
Easting	900563.0312287982	**Northing**	6565632.278082406
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Granite,Quartz
Soil type	Clay	**Surface stone cover**	
Soil colour	Orange,Red	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Low (<10 m)	Woodland (20-50%)	*eremophila sp. Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*ptilotus sp.*

Fulcrum photo ID	2b2a12b3-b9f2-4fd2-9d5d-b72a773595d9,19860892-f6e1-4a85-843a-

HABC2LC05

Project:	4828 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	LC
Easting	900752.345712022	**Northing**	6565409.609161669
Landform and soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Granite,Quartz
Soil type	Clay	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Erosion,Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	Rabbit		

Vegetation			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*eremophila sp.*

Fulcrum photo ID	bc023295-6531-4172-95cc-e3d96c28e365,3b64dc10-30df-4627-8e7f-

HABC2LC06

Project:	4829 Coolgardie Biological Spring Survey		
Date	2021-11-15	**Personnel**	LC
Easting	900415.1933355466	**Northing**	6565440.556371264
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Clay	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Hollows - logs,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Open forest (50-80%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp., salt bush sp. (in photos)*
Ground stratum	Absent		

Fulcrum photo ID	30f77ad9-d6b9-45a3-885d-56cf525debd8,a70c538c-fc2a-4dbd-be76-

C2H14

Project:	4830 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	898138.1000480026	**Northing**	6564928.758600489
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Ironstone
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia sp*
Ground stratum	Absent		

Fulcrum photo ID	6eb608e3-e562-4314-b5d8-0ecf176e3906

C2H16

Project:	4831 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	898035.707931469	**Northing**	6564690.336170336
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Ironstone
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Eremophila*
Ground stratum	Absent		

Fulcrum photo ID	10efecf9-ff45-4474-8f07-5ef50a3af30e

C2H18

Project:	4832 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	897721.3419470013	**Northing**	6564081.199149741
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Calcrete,Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition			
Quality	Disturbed	**Habitat Features**	
Fire History	Unknown	**Water Source**	Absent
Disturbance		**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Eremophila*
Ground stratum	Absent		

Fulcrum photo ID	25ba9c30-9a14-438f-952a-4d1cff16da86

C2H20

Project:	4833 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	897584.545833359	**Northing**	6563668.195859093
Landform and soil		**Rock**	
Landform	Escarpment	**Rock type/s**	Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Eremophila*
Ground stratum			

Fulcrum photo ID	2cd10b5a-17ad-4733-9cfb-f59f28c2f915

C2H22

Project:	4834 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	897407.7797388354	**Northing**	6563338.106537405
Landform and soil		**Rock**	
Landform	Lower slope	**Rock type/s**	Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance		**Microhabitats**	Hollows - trees,Leaf litter,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia sp*
Ground stratum	Absent		

Fulcrum photo ID	41f4047f-24e6-432f-a252-5b9c5469bfc3

C2H24

Project:	4835 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	897534.3882230611	**Northing**	6563041.229803004
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Calcrete,Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Atriplex sp*
Ground stratum	Absent		

Fulcrum photo ID	271b8409-d185-4552-a223-f5daf7b9d31a

C2H26

Project:	4836 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	898122.0154905103	**Northing**	6562781.590976534
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*Senna sp*
Ground stratum			

Fulcrum photo ID	1f602d5d-5404-457f-b29f-7f84c7aaf087

C2H28

Project:	4837 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	898839.090998794	**Northing**	6563393.36065102
Landform and soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Eremophila*
Ground stratum	Absent		

Fulcrum photo ID	c4b932de-0fdf-423c-ad63-8302ddd73365

C2H30

Project:	4838 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	SW
Easting	898737.6863762725	**Northing**	6563394.817201562
Landform and soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Erosion	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia*
Ground stratum	Absent		

Fulcrum photo ID	d16a4f03-6dd4-407a-9184-f1b3cd802bc0

HABC2LC07

Project:	4839 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	LC
Easting	900704.6350980257	**Northing**	6565575.750708525
Landform and soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Granite,Quartz
Soil type	Clay	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Erosion	**Microhabitats**	Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*eremophila sp.*

Fulcrum photo ID	51affc75-b427-4809-8ef2-d024d562bb5f,266b71e9-b0ea-422e-8f3d-

HABC2LC08

Project:	4840 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	LC
Easting	900776.5532258475	**Northing**	6565713.262605984
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Granite
Soil type	Clay	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Leaf litter,Peeling bark,Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*ptilotus sp.*

Fulcrum photo ID	21c66f48-529d-461a-b6c1-d0ce4033c0f2,193ee8c1-7c0d-4271-ac0a-

HABC2LC09

Project:	4841 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	LC
Easting	900164.9336511727	**Northing**	6565653.958929246
Landform and soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Granite,Quartz
Soil type	Sand	**Surface stone cover**	
Soil colour	Orange,White	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Erosion	**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*eremophila sp.*
Ground stratum	Mid (0.5-1 m)	Forbland (50-80%)	*eremophila sp.*

Fulcrum photo ID	0fca10bc-0b3f-4884-a596-1bdc49f0718d,8c8bcab2-c4f1-453a-9933-

HABC2LC10

Project:	4842 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	LC
Easting	900449.314056684	**Northing**	6564956.76156202
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Clay	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Clearing,Erosion,Litter	**Microhabitats**	Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*eremophila sp.*
Ground stratum	Mid (0.5-1 m)	Forbland (50-80%)	*eremophila sp.*

Fulcrum photo ID	490f139c-c787-45ce-8b70-4790296ee53c,e21395e7-7464-42cf-bbb9-

HABC2LC11

Project:	4843 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	LC
Easting	901276.6564614684	**Northing**	6565677.347229139
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Clay	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Forbland (50-80%)	*eremophila sp.*

Fulcrum photo ID	bbb0226c-b301-4a5f-ae00-44c3dc787f94,d6688097-4e41-4751-a79f-

HABC2LC12

Project:	4844 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	LC
Easting	900519.9630059553	**Northing**	6566882.003260277
Landform and soil		**Rock**	
Landform	Claypan	**Rock type/s**	None
Soil type	Clay	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Unknown	**Water Source**	Present
Disturbance	Vehicle tracks,Weeds	**Microhabitats**	
Introduced fauna	None observed		

Vegetation

Upper stratum	Absent		
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Grassland (50-80%)	*various weeds*

Fulcrum photo ID	5e418349-31da-4044-8d04-a4990c1f72b0,450a84a8-a05b-4ee2-a0d1-

HABC2LC13

Project:	4845 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	LC
Easting	900731.210354395	**Northing**	6567309.737509467
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	High quality		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Low (<10 m)	Woodland (20-50%)	*eucalyptus sp.*
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*eremophila sp.*
Ground stratum	Mid (0.5-1 m)	Open forbland (20-50%)	*eremophila sp. amd other mixed herbs*

Fulcrum photo ID	570709d4-00c6-43d2-9de6-ef44159e1c8e,2c8bbe5f-630c-45f1-87bb-

HABC2LC14

Project:	4846 Coolgardie Biological Spring Survey		
Date	2021-11-16	**Personnel**	LC
Easting	900023.0356903123	**Northing**	6566601.201476825
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Clearing,Vehicle tracks,Weeds	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Rock crevices,Woody debris
Introduced fauna	Goat,Rabbit		

Vegetation			
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	*eucalyptus sp.*
Mid stratum	Tall (>2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*acacia sp.*
Ground stratum	Low (>0.5 m)	Forbland (50-80%)	*eremophila sp.*

Fulcrum photo ID	2cc3ef18-e4b7-46ee-9c1d-0f4614438dc9,6c342fc0-f7f5-443d-9f15-

HABC2LC15

Project:	4847 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	LC
Easting	900431.2214361653	**Northing**	6572530.387661901
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*dodenea sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*ptilotus sp.*

Fulcrum photo ID	4199f50b-b3c4-4fd5-9f8a-3a7d7df69999,761b02e4-9a61-427a-b17e-

HABC2LC16

Project:	4848 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	LC
Easting	900465.6771902259	**Northing**	6573277.0945564695
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Calcrete,Granite
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown	**Surface stone size classes present**	0 - 5%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	Cattle		

Vegetation			
Upper stratum	Low (<10 m)	Open forest (50-80%)	*eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Mid (0.5-1 m)	Sparse forbland (0.25-20%)	*eremophila sp. mixed herbs*

Fulcrum photo ID	c208e2cf-2947-4ff4-b0f0-2556bb277948,c4d25400-28ff-4427-be00-

HABC2LC17

Project:	4849 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	LC
Easting	897973.2561752913	**Northing**	6573513.342421641
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	5 - 25%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Open forest (50-80%)	*eucalyptus sp., acacia sp.*
Mid stratum	Low (0.5-1 m)	Shrubland and/or heathland (50-80%)	*dodenea sp, eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*ptilotus sp., eremophila sp.*

Fulcrum photo ID	372d8949-1d3b-4870-87bd-7951b013d9e4,6cf82aac-74d5-4f6d-afb6-

HABC2LC18

Project:	4850 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	LC
Easting	897208.723548352	**Northing**	6573995.251239745
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*eucalyptus sp.*
Mid stratum	Tall (>2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*eremophila sp.*
Ground stratum	Tall (1-2 m)	Forbland (50-80%)	*eremophila sp.*

Fulcrum photo ID	7081e49e-b513-4cfc-a25e-8219bc15b8f3,4be2e29b-ea2a-4adf-9a60-

HABC2LC19

Project:	4851 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	LC
Easting	897024.5424583412	**Northing**	6573400.948208064
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Calcrete,Ironstone,Laterite
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	75 - 100%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*eucalyptus sp.*
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*herb in photos*

Fulcrum photo ID	4635704e-82e0-486f-bffd-6cb63a245066,db940a29-9610-40ed-a43e-

HABC2LC20

Project:	4852 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	LC
Easting	897207.7894486763	**Northing**	6573276.328611162
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eucalyptus sp.*
Ground stratum	Mid (0.5-1 m)	Forbland (50-80%)	*eremophila sp. eremophila sp.*

Fulcrum photo ID	b50692de-a768-4d17-bf33-bb534451e50e,1a36084b-a01d-479b-8a3d-

C2H32

Project:	4853 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	SW
Easting	898647.6288961614	**Northing**	6563412.670039611
Landform and soil		**Rock**	
Landform	Escarpment	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia sp*
Ground stratum	Absent		

Fulcrum photo ID	6fed3548-6854-44ad-ace1-79cee900d9bb

C2H34

Project:	4854 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	SW
Easting	898574.3445931688	**Northing**	6563567.903756286
Landform and soil		**Rock**	
Landform	Lower slope	**Rock type/s**	Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance		**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia*
Ground stratum	Absent		

Fulcrum photo ID	5cebab13-aadb-470a-b104-5994b272e88d

C2H36

Project:	4855 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	SW
Easting	898440.2002370819	**Northing**	6572518.477781318
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Granite,Laterite
Soil type	Loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation			
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Eremophila*
Ground stratum	Absent		

Fulcrum photo ID	3ee1eb2e-e0e3-4e77-9780-bb40cd650728

C2H38

Project:	4856 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	SW
Easting	898296.4071683842	**Northing**	6572123.600769359
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Granite,Laterite,Quartz
Soil type	Loam	**Surface stone cover**	
Soil colour	Orange,Red	**Surface stone size classes present**	50 - 75%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Unknown	**Water Source**	Absent
Disturbance		**Microhabitats**	Hollows - logs,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia*
Ground stratum	Absent		

Fulcrum photo ID	b933e67c-48b0-421d-8100-6518118a4171

C2H40

Project:	4857 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	SW
Easting	897937.4325779848	**Northing**	6572315.898469241
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Laterite,Quartz
Soil type	Loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	50 - 75%
Condition			
Quality	Very good	**Habitat Features**	
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Hollows - logs,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia*
Ground stratum	Absent		

Fulcrum photo ID	219563fd-c9bd-4cd0-8160-634649c52222

C2H42

Project:	4858 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	SW
Easting	897160.8402197923	**Northing**	6571960.858564717
Landform and soil		**Rock**	
Landform	Lower slope	**Rock type/s**	Ironstone,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	75 - 100%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Eremophila*
Ground stratum	Absent		

Fulcrum photo ID	e4db22e5-83d5-4438-9c84-680175928daf

C2H46

Project:	4859 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	SW
Easting	897842.0485219336	**Northing**	6571592.065394482
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Ironstone,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Eremophila and Atriplex*
Ground stratum	Absent		

Fulcrum photo ID	d8c7d48f-634c-4c46-a402-4949c69c1196

C2H48

Project:	4860 Coolgardie Biological Spring Survey		
Date	2021-11-17	**Personnel**	SW
Easting	897986.3585784157	**Northing**	6572856.793533593
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Granite,Ironstone,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Unknown	**Water Source**	Absent
Disturbance		**Microhabitats**	Hollows - logs,Leaf litter,Peeling bark,Woody debris
Introduced fauna			

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia, eremophila, senna*
Ground stratum	Absent		

Fulcrum photo ID	77fa71fc-2061-4776-b46f-5533c5547e69

C2H50

Project:	4861 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	SW
Easting	899410.3384907652	**Northing**	6573733.02122001
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Woody debris
Introduced fauna	Rabbit		

Vegetation			
Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Allocasuarina, Acacia*
Ground stratum	Absent		

Fulcrum photo ID	fc56790e-0b7a-4af8-83ad-43361892dc2a

C2H52

Project:	4862 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	SW
Easting	899024.133330778	**Northing**	6573326.9469294455
Landform and soil		**Rock**	
Landform	Claypan	**Rock type/s**	Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Woody debris
Introduced fauna	Cattle,Rabbit		

Vegetation

Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Eremophila*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*Weed*

Fulcrum photo ID	3932baf5-4aea-4948-89e6-ec5c8ba929e9

C2H54

Project:	4863 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	SW
Easting	898558.6120445768	**Northing**	6577434.127282435
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Ironstone,Laterite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Hollows - logs,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Eremophila*
Ground stratum	Absent		

Fulcrum photo ID	90af6e6b-2828-4926-bd8c-7ce23e0bbedf

C3H2

Project:	4864 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	SW
Easting	901330.4863598039	**Northing**	6566876.698387651
Landform and soil		**Rock**	
Landform	Upper slope	**Rock type/s**	Granite,Laterite
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	*Senna sp*
Ground stratum	Absent		

Fulcrum photo ID	9639322a-c25b-452c-9395-2d845a0db67d

C3H6

Project:	4865 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	SW
Easting	901099.8592427254	**Northing**	6567133.638773368
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Granite,Laterite,Quartz
Soil type	Clay	**Surface stone cover**	
Soil colour	Brown	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	None observed	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	Cattle		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Eremophila*
Ground stratum	Absent		

Fulcrum photo ID	8c9b4a09-e53a-4d9d-8d80-11e634b91457

HABC2LC21

Project:	4866 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	LC
Easting	897544.5825756477	**Northing**	6572777.829306185
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Ironstone,Quartz
Soil type	Clay	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*eremophila sp*

Fulcrum photo ID	0f0d98ec-ac0a-44f0-8ad5-c4fc373482ad,537a883e-d403-430b-8f06-

HABC2LC22

Project:	4867 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	LC
Easting	897656.784997021	**Northing**	6572883.799383562
Landform and soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Calcrete,Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Highly degraded		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Clearing,Erosion,Vehicle tracks	**Microhabitats**	Rock crevices,Woody debris
Introduced fauna	None observed		

Vegetation

Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*eucalyptus sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*eremophila sp.*

Fulcrum photo ID	0cc91ff4-82c9-4e1a-8a1d-4d2ee6573b54,5ea1acb4-732a-4029-ace5-

HABC2LC23

Project:	4868 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	LC
Easting	897726.5517688439	**Northing**	6573587.154734112
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	*eremophila sp.*

Fulcrum photo ID	af1106ec-72c2-4078-a6cf-65fdc8ed54e0,772849ce-8e9f-4ea7-8aff-

HABC2LC24

Project:	4869 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	LC
Easting	897731.7215430276	**Northing**	6578600.152287805
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Calcrete,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Disturbed		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Leaf litter,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*eremophila sp.*

Fulcrum photo ID	7264e4af-f5e3-4399-a7c3-718a30cf91f9,043ac726-f8bb-4b81-9e64-

HABC3LC01

Project:	4870 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	LC
Easting	901535.8496579034	**Northing**	6568495.428023138
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite,Ironstone,Quartz
Soil type	Clay loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	0 - 5%
Condition		**Habitat Features**	
Quality	Very good	**Water Source**	Absent
Fire History	Unknown	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Disturbance	Vehicle tracks,Weeds		
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)	*eremophila sp.*
Ground stratum	Mid (0.5-1 m)	Forbland (50-80%)	*eremophila sp.*

Fulcrum photo ID	8e57e003-8ef0-4049-8a3d-f7be3316a26a,985a366e-c098-4cbd-9c83-

HABC3LC02

Project:	4871 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	LC
Easting	901385.6159884571	**Northing**	6567944.72848946
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Calcrete,Granite,Ironstone
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Orange	**Surface stone size classes present**	5 - 25%
Condition		**Habitat Features**	
Quality	Good	**Water Source**	Absent
Fire History	Unknown	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Disturbance	Litter,Vehicle tracks		
Introduced fauna	Cattle		

Vegetation			
Upper stratum	Low (<10 m)	Woodland (20-50%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*eremophila sp., sandlewood*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*eremophila sp. and mixed herbs*

Fulcrum photo ID	0456611e-322d-43f0-961a-92e3214f4ff6,b383b714-6500-46fb-b290-

HABC3LC03

Project:	4872 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	LC
Easting	901116.1473216031	**Northing**	6567716.167221133
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Calcrete,Granite
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Brown,Orange,Red	**Surface stone size classes present**	50 - 75%
Condition		**Habitat Features**	
Quality	Good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Litter,Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*dodenea sp, mixed shrubs*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*mixed herbs*

Fulcrum photo ID	a233588d-1aef-4741-8ae9-5b0d1c66fa0a,42b4783a-a56b-40d7-8240-

HABC3LC04

Project:	4873 Coolgardie Biological Spring Survey		
Date	2021-11-18	**Personnel**	LC
Easting	900730.2686670613	**Northing**	6567991.079386459
Landform and soil		**Rock**	
Landform	Plain	**Rock type/s**	Calcrete,Granite
Soil type	Sandy loam	**Surface stone cover**	
Soil colour	Orange	**Surface stone size classes present**	25 - 50%
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Vehicle tracks	**Microhabitats**	Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus sp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*eremophila sp.*
Ground stratum	Mid (0.5-1 m)	Sparse forbland (0.25-20%)	*eremophila sp., mixed herbs*

Fulcrum photo ID	20c229a2-37df-4ff5-9e14-6fa99181557f,a6d138ee-2032-4f92-93bc-

Appendix G
Fauna Inventory

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			State	[illegible]ederal	Sighting	Call	Remains	Scat	Tracks	Burrow	Digging
Aves											
Acanthizidae	*Smicrornis brevirostris*	Weebill				2					
	Acanthiza inornata	Western Thornbill				2					
	Aphelocephala leucopsis	Southern Whiteface				1					
	Calamanthus cautus	Shy Groundwren (Shy Heathwren)				1					
	Acanthiza uropygialis	Chestnut-rumped Thornbill			2	1					
	Sericornis frontalis					1					
Artamidae	*Artamus personatus*	Masked Woodswallow			2						
Cacatuidae	*Cacatua roseicapilla*	Galah				1					
	Cacatua leadbeateri	Major Mitchell's Cockatoo				1					
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike		MA	2			1			
	Coracina maxima	Ground Cuckoo-shrike				1					
	Lalage tricolor	White-winged Triller				1					
Climacteridae	*Climacteris rufus*	Rufous Treecreeper				1					
Columbidae	*Phaps chalcoptera*	Common Bronzewing			1						
	Ocyphaps lophotes	Crested Pigeon			3						
Corvidae	*Corvus bennetti*	Little Crow				5					
	Corvus orru cecilae	Western Crow				1					
	Corvus coronoides	Australian Raven			2						
Cracticidae	*Strepera versicolor*	Grey Currawong			4	2					
Dromaiidae	*Dromaius novaehollandiae*	Emu						1	2		
Estrildidae	*Taeniopygia guttata*	Zebra Finch				2					
Falconidae	*Falco cenchroides*	Australian Kestrel (Nankeen Kestrel)		MA	3						
Maluridae	*Malurus splendens*	Splendid Fairywren				1					
Meliphagidae	*Anthochaera carunculata*	Red Wattlebird			1	3					
	Lichmera indistincta	Brown Honeyeater				1					
	Gavicalis virescens	Singing Honeyeater			13	2					

Family	Scientific Name	Common Name	Conservation Status		Method						
			State	Federal	Sighting	Call	Remains	Scat	Tracks	Burrow	Digging
	Manorina flavigula	Yellow-throated Miner				4					
	Acanthagenys rufogularis	Spiny-cheeked Honeyeater			7						
	Melithreptus brevirostris	Brown-headed Honeyeater				1					
	Gliciphila melanops	Tawny-crowned Honeyeater			2	1					
Meropidae	*Merops ornatus*	Rainbow Bee-eater		MA	1						
Monarchidae	*Grallina cyanoleuca*	Magpie-lark		MA	2						
Motacillidae	*Anthus australis*	Australian Pipit			4						
Oreoicidae	*Oreoica gutturalis*	Crested Bellbird			1	11					
Otididae	*Ardeotis australis*	Australian Bustard							1		
Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler			5	8					
	Pachycephala occidentalis	Western Golden Whistler (Western Whistler)			6						
Petroicidae	*Microeca fascinans*	Jacky Winter			1	1					
Psittacidae	*Melopsittacus undulatus*	Budgerigar			23						
	Platycercus zonarius	Australian Ringneck			17	2					
Psophodidae	*Cinclosoma clarum*	Western Chestnut Quail-thrush (Copperback Quail-thrush)			2						
Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail			2						
Mammalia											
Bovidae	**Capra hircus*	Goat						8	1		
	**Bos taurus*	European Cattle						9	7		
Canidae	**Canis familiaris familiaris*	Dog						2			
	**Vulpes vulpes*	Red Fox						1			
Dasyuridae	*Dasyurus geoffroii fortis*	Western Quoll, Chuditch	VU	VU				1			
Equidae	**Equus caballus*	Horse						1			
Felidae	**Felis catus*	Cat					1				
Leporidae	**Oryctolagus cuniculus*	Rabbit			1		3	18		1	2
Macropodidae	*Macropus fuliginosus melanops*	Western Grey Kangaroo			1			39	2		
	Osphranter rufus	Red Kangaroo, Marlu			2						
Reptilia											
Agamidae	*Ctenophorus maculatus*				2						

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			State	□ederal	Sighting	Call	Remains	Scat	Tracks	Burrow	Digging
	Ctenophorus cristatus	Bicycle Dragon			6						
	Tympanocryptis pseudopsephos	Goldfields pebble-mimic dragons			2						
	Ctenophorus ornatus	Ornate Crevice Dragon			1						
Diplodactylidae	*Crenadactylus ocellatus*	South-western Clawless Gecko			3						
Gekkonidae	*Heteronotia binoei*	Bynoe's Gecko			8						
	Gehyra variegata	Variegated gehyra			2						
Scincidae	*Tiliqua rugosa*	Bobtail			8		2				
Varanidae	*Varanus gouldii*	Bungarra or Sand Goanna			1						

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