



**VP ENVIRONMENTAL**  
PTY LTD.

**ABN 21 639 246 601**

**Jaurdi Gold Project  
Flora and Fauna Assessment  
M16/561**



**Prepared for  
Beacon Minerals Limited  
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## GLOSSARY

Acronym	Description
<b>ANCA</b>	Australian Nature Conservation Agency.
<b>BAM Act</b>	<i>Biosecurity and Agriculture Management Act 2007</i> , WA Government.
<b>BC Act</b>	<i>Biodiversity Conservation Act 2016</i> , WA Government.
<b>BoM</b>	Bureau of Meteorology.
<b>DAFWA</b>	Department of Agriculture and Food (now DPIRD), WA Government.
<b>DAWE</b>	Department of Agriculture, Water and Environment (formerly DotEE), Australian Government.
<b>DBCA</b>	Department of Biodiversity, Conservation and Attractions (formerly DPaW), WA Government.
<b>DER</b>	Department of Environment Regulation (now DWER), WA Government.
<b>DMIRS</b>	Department of Mines, Industry Regulation and Safety (formerly DMP), WA Government
<b>DMP</b>	Department of Mines and Petroleum (now DMIRS), WA Government.
<b>DotEE</b>	Department of the Environment and Energy (now DAWE), Australian Government.
<b>DoW</b>	Department of Water (now DWER), WA Government.
<b>DPaW</b>	Department of Parks and Wildlife (now DBCA), WA Government.

Acronym	Description
<b>DPIRD</b>	Department of Primary Industries and Regional Development, WA Government
<b>DWER</b>	Department of Water and Environmental Regulation (formerly EPA, DER and DoW), WA Government
<b>EP Act</b>	Environmental Protection Act 1986, WA Government.
<b>EP Regulations</b>	Environmental Protection (Clearing of Native Vegetation) Regulations 2004, WA Government.
<b>EPA</b>	Environmental Protection Authority (now DWER), WA Government.
<b>EPBC Act</b>	<i>Environment Protection and Biodiversity Conservation Act 1999</i> , Australian Government.
<b>ESA</b>	Environmentally Sensitive Area.
<b>Ha</b>	Hectare (10,000 square metres).
<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia.
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union.
<b>Km</b>	Kilometre (1,000 metres).
<b>MVG</b>	Major Vegetation Groups.
<b>NVIS</b>	National Vegetation Information System.
<b>OEPA</b>	Office of the Environmental Protection Authority, WA Government.
<b>PEC</b>	Priority Ecological Community.
<b>RAOU</b>	Royal Australia Ornithologist Union.
<b>SRE</b>	Short Range Endemic.
<b>SSC</b>	Species Survival Commission, International.
<b>TEC</b>	Threatened Ecological Community.
<b>WA</b>	Western Australia.
<b>WAHERB</b>	Western Australian Herbarium.
<b>WAM</b>	Western Australian Museum, WA Government.

## 1 INTRODUCTION

VP Environmental Pty Ltd (VP) were commissioned by Beacon Minerals Limited (Beacon) to conduct a reconnaissance flora/vegetation survey and basic terrestrial fauna survey of tenement M16/561 for the Jaurdi Gold Project (referred to as the 'survey area'). The survey area encompasses an area of approximately 77 ha (Figure 1-1) and is located approximately 35km north-west of Coolgardie and 50km west of Kalgoorlie-Boulder, Western Australia (Figure 1-2).

The purpose of the assessment was to provide supporting documentation for a Clearing Permit and Mining Proposal application for mining activities within M16/561. The objectives of the assessment were to:

- Summarise the existing environment present within the survey area;
- Conduct a literature review, database and map-based searches of flora, vegetation and fauna with the potential to occur within the survey area;
- Assess the potential for conservation significant flora, vegetation and fauna to occur within the survey area;
- Conduct a field survey to verify / ground truth the desktop assessment findings through reconnaissance flora survey and basic terrestrial fauna survey in accordance with relevant Environmental Protection Authority (EPA) published flora and fauna technical guidelines;
- Provide an inventory of all vascular flora species recorded within the survey area (including introduced and annual flora);
- Conduct vegetation community mapping and characterise vegetation types in accordance with the National Vegetation Information System (NVIS) classifications;
- Conduct vegetation condition mapping using an appropriate condition scale for the bioregion in accordance with EPA (2016) *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment*;
- Conduct fauna habitat mapping and characterise fauna habitats present in the survey area;
- Document and map locations of any significant species and communities identified within the survey area; and
- Assess the findings of the survey against relevant Commonwealth and State environmental legislation.





Figure 1-1: Survey area





Figure 1-2: Regional location of the survey area



## 2 EXISTING ENVIRONMENT

### 2.1 REGIONAL SETTING

The survey area lies within the South-West Interzone of WA in the Coolgardie Botanical District. Based on the Interim Biogeographic Regionalisation of Australia (IBRA, Version 7) (DotEE, 2012) the survey area is located within the Coolgardie Bioregion of WA. The Coolgardie Bioregion is further divided into three subregions; Mardabilla (COO1), Southern Cross (COO2) and Eastern Goldfields (COO3) with the survey area located within the Eastern Goldfields subregion (Figure 2-1).

The Coolgardie Bioregion is located within the Yilgarn Craton. Its granite basement includes Archaean Greenstone intrusions in parallel belts. Drainage is occluded (McKenzie, May & McKenna, 2002). Diverse woodlands, rich in endemic eucalypts, occur on low greenstone hills, on alluvial soils on the valley floors, around the saline playas of the region's occluded drainage system, and on broad plains of calcareous earths (McKenzie, May & McKenna, 2002).

The Eastern Goldfields subregion lies on the Yilgarn Craton's 'Eastern Goldfields Terrains'. The relief is subdued and comprised 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).

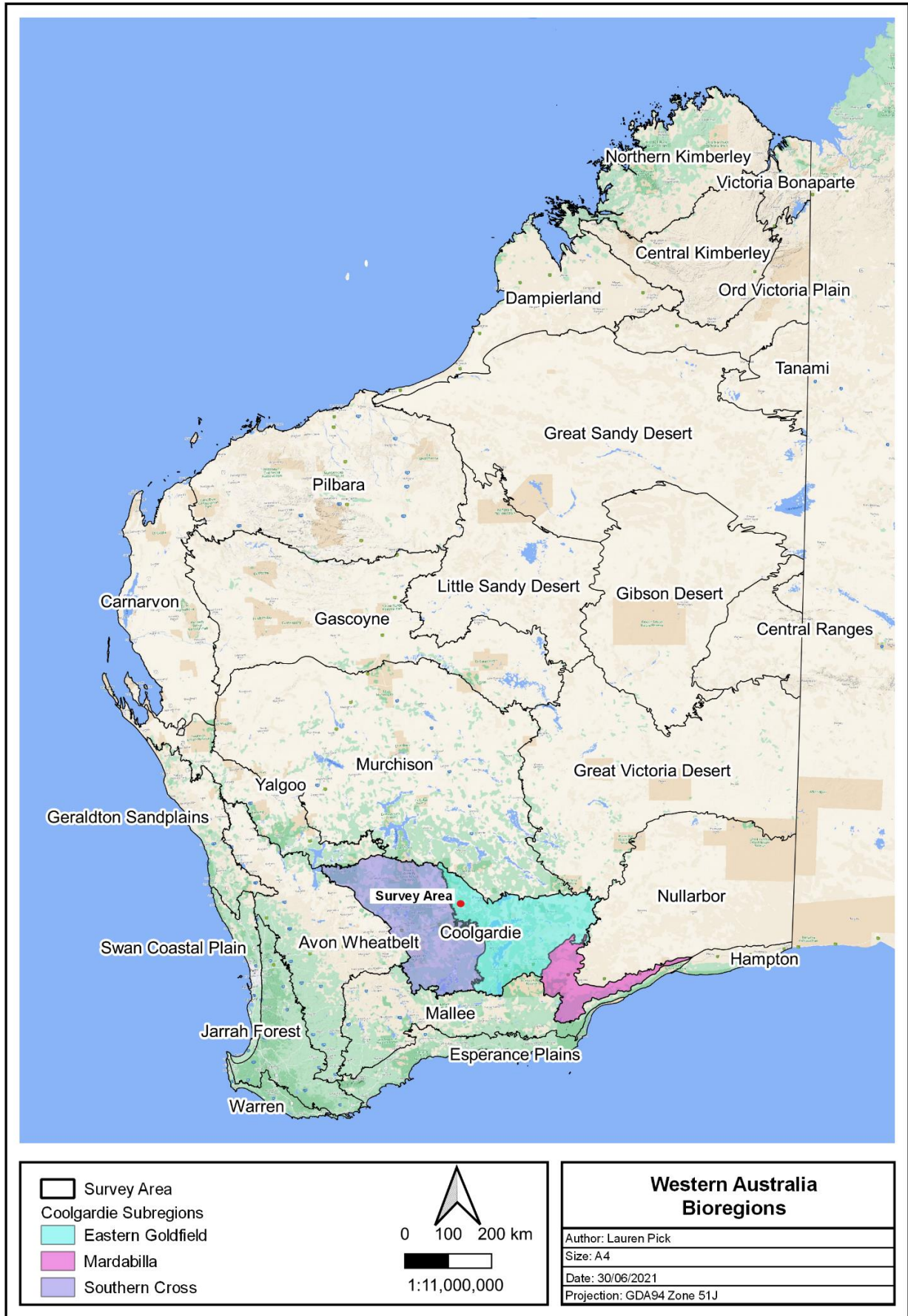


Figure 2-1: IBRA Bioregions in relation to the survey area

## 2.2 CLIMATE

The climate of the Eastern Goldfields subregion is characterised as an arid to semi-arid climate with annual rainfall of approximately 200-300 mm (Beard, 1990; Cowan, 2001). Average climate data for the Kalgoorlie-Boulder Bureau of Meteorology (BoM) weather station (#12038) is provided in Figure 2-2. Mean maximum temperature ranges from 33.6°C in January to 16.8°C in July. Mean rainfall ranges from 32.4mm in February to 13.5mm in September with majority of the rainfall occurring during summer and winter months (BoM, 2021). Monthly rainfall data for the Kalgoorlie airport weather station (#12038) is shown in Figure 2-3 (BoM, 2021). Rainfall in the months preceding the survey (February-March 2021) was above average.

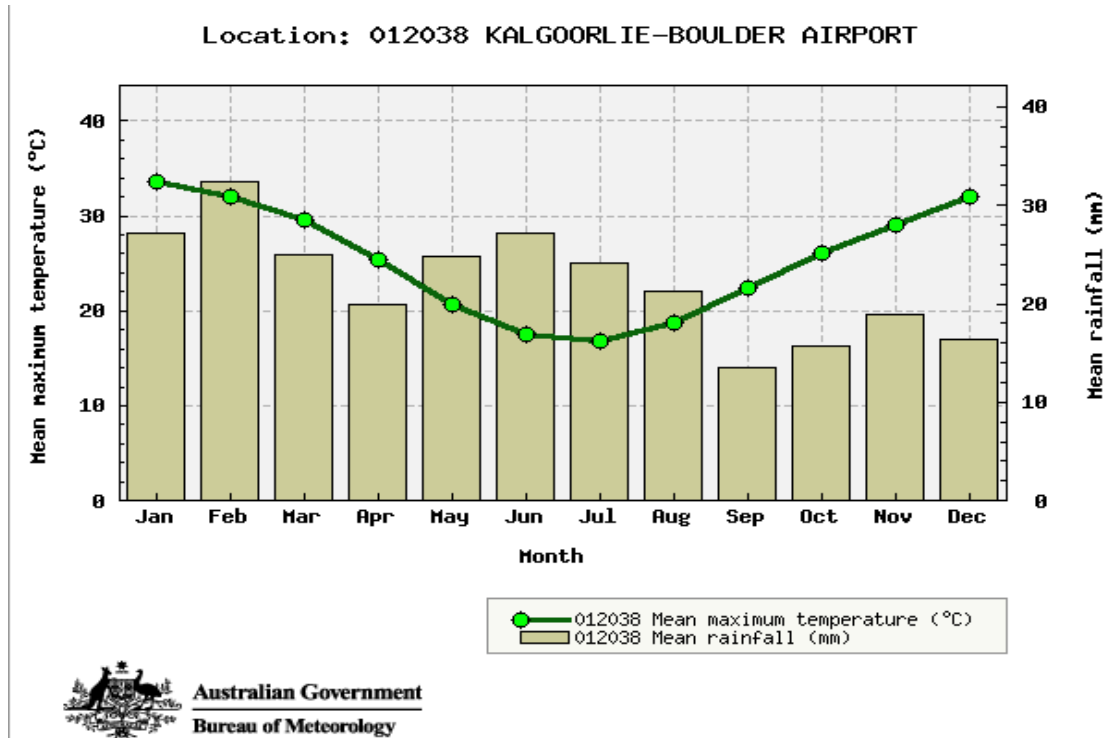


Figure 2-2: Average climatic conditions Kalgoorlie-Boulder weather station (BoM, 2021)

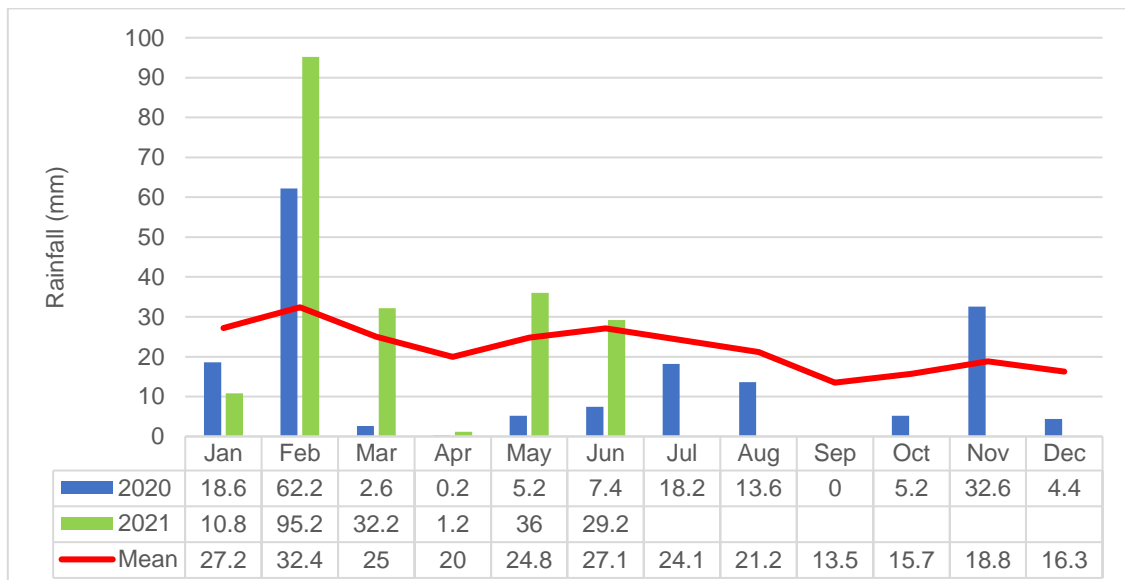


Figure 2-3: Monthly rainfall Kalgoorlie-Boulder weather station (BoM, 2021)



## 2.3 PRE-EUROPEAN VEGETATION

Vegetation of the Eastern Goldfields subregion comprises of Mallees, Acacia thickets and shrub heaths on sand plains. Diverse Eucalypt woodlands occur around salt lakes, on ranges, and in valleys. Salt lakes support dwarf shrublands of samphire (Cowan, 2001). The Department of Primary Industries and Regional Development (DPIRD) GIS file (2018) indicates that the survey area is located within one pre-European vegetation association; Boorabbin 8. The extent of this vegetation association as specified in the 2018 *Statewide Vegetation Statistics* (DBCA, 2019) is provided in Table 2-1.

Areas retaining less than 30% of their pre-European vegetation extent generally experience exponentially accelerated species loss, while areas with less than 10% are considered “endangered” (EPA, 2000). Development within the survey area will not significantly reduce the extent of pre-European vegetation.

**Table 2-1: Extent of Pre-European Vegetation Associations with the survey area**

Region	Pre-European extent, ha	Current extent, ha	% remaining	% current extent protected for conservation <sup>1</sup>	Extent within survey area (ha)	% of current extent within the survey area
<b>Vegetation Association Boorabbin 8: Medium woodland; salmon gum &amp; gimlet</b>						
Western Australia	115,004.15	114,880.35	99.89	5.04	77	0.07
Eastern Goldfields Subregion	81,850.70	81,726.90	99.85	0		0.09

Note: 1) IUCN categories 1 – IV

## 2.4 SOILS AND LANDSCAPE SYSTEMS

Based on geographic information provided by the DPIRD (2019), the survey area is located within the Norseman Zone (266) of the Kalgoorlie Province (26).

The Kalgoorlie Province is characterised by undulating plains (with some sandplains, hills and salt lakes) on the granitic rocks and greenstone of the Yilgarn Craton. Soils include calcareous loamy earths and red loamy earths with some salt lake soils, red deep sands, yellow sandy earths, shallow loams and loamy duplexes. Vegetation is dominated by Eucalypt woodlands with some Acacia-Casuarina thickets, Mulga shrublands, Halophytic shrublands and Spinifex grasslands. This Province is located in the southern Goldfields between Paynes Find, Menzies, Southern Cross and Balladonia (Tille, 2006).

The Norseman Zone is characterised by undulating plains and uplands (with some sandplains and salt lakes) on granitic rocks of the Yilgarn Craton. Soils comprise of calcareous loamy earths, yellow sandy and loamy earths, red loamy earths, red deep sands and salt lake soils. Vegetation includes Salmon Gum-redwood-merrit-red mallee-gimlet woodland with Acacia/ Casuarina thickets (and some Mulga shrublands and Spinifex grasslands). This zone is located in the southern Goldfields between Koolyanobbing, Menzies, Zanthus (Trans-Australian Railway), Norseman and Lake Hope (Tille, 2006).

The Norseman Zone is further divided into soil landscape systems with the survey area located within one soil landscape system as described in Table 2-2.

**Table 2-2: Soil Landscape Systems within the survey area**

Soil Landscape System	Description	Extent within survey area (ha)	Extent within the Coolgardie Bioregion (ha)	% of total extent within the survey area
Mx43	Gently undulating valley plains and pediments; some outcrop of basic rock	77	1,534,458	0.005

## 2.5 HYDROLOGY

According to the Geoscience Australia Global Map Australia database (2015), there are no permanent or ephemeral inland waters within the survey area. No permanent drainage lines occur within the survey area however an ephemeral drainage line intersects the far south-western corner of the survey area (Figure 2-4).

Groundwater Dependent Ecosystems (GDE) includes biological assemblages of species such as wetlands or woodlands that use groundwater either opportunistically or as their primary water source. For the purposes of this report, a GDE is defined as any vegetation community that derives part of its water budget from groundwater and must be assumed to have some degree of groundwater dependency. According to the BoM *Atlas of Groundwater Dependent Ecosystems* database (BoM, 2020), there are no potential terrestrial GDEs within the survey area. A low potential aquatic GDE associated with an ephemeral drainage line intersects the far south-western corner of the survey area. This potential aquatic GDE is described below in Table 2-3 and shown spatially in Figure 2-4.

**Table 2-3: Potential Terrestrial Groundwater Dependent Ecosystems (BoM, 2020)**

GDE Description	Potential GDE (according to BoM, 2020)
Undulating plains with some sandplains, ferruginous breakaways; ridges of metamorphic rocks and granitic hills and rises; calcretes, large salt lakes and dunes along valleys.	Low potential GDE

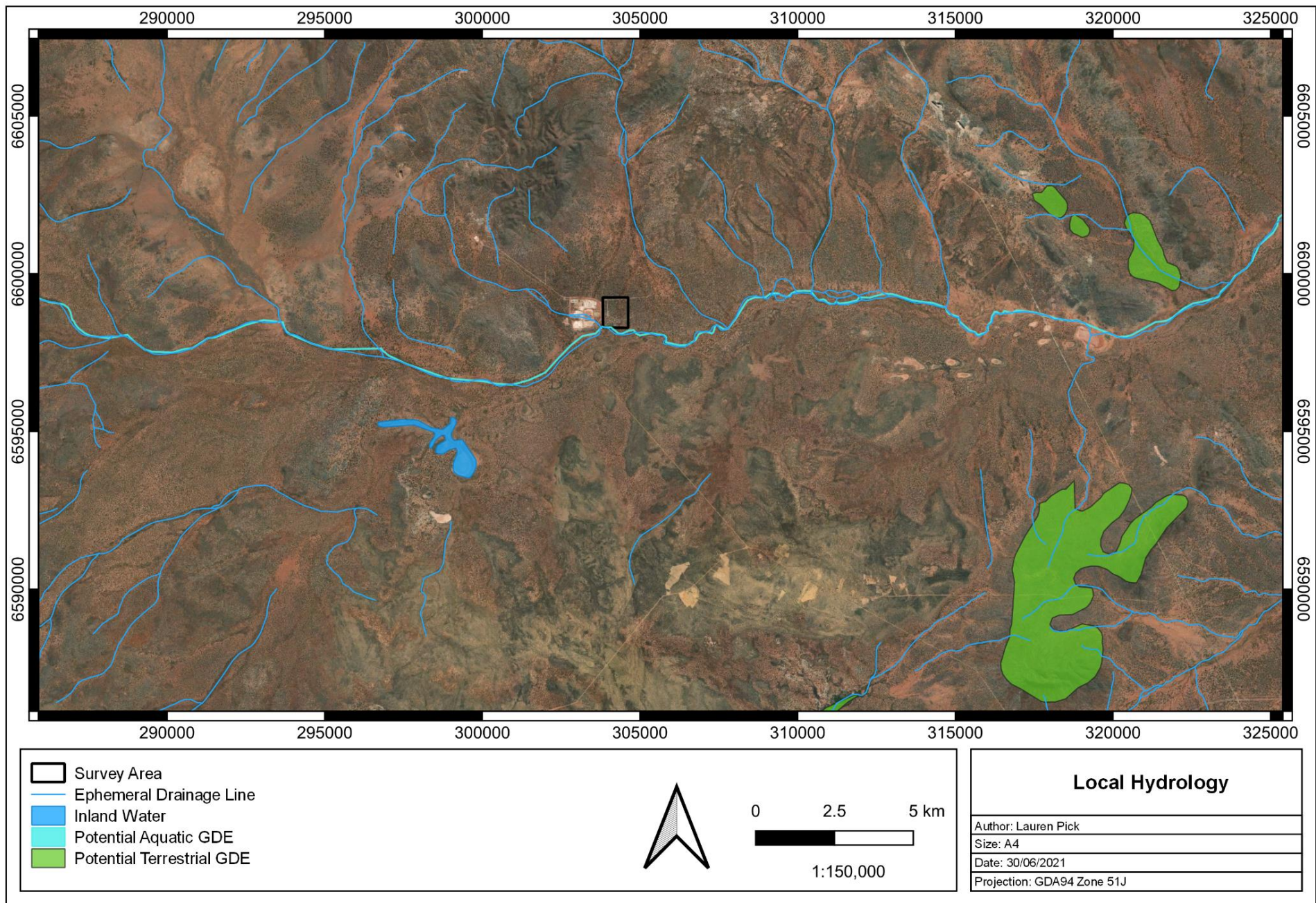


Figure 2-4: Local hydrological features in relation to the survey area



## 2.6 CONSERVATION AREAS & GOVERNMENT RESERVES

The survey area is not located within an Environmentally Sensitive Area (ESA) as listed under the *Environmental Protection Act 1986* or any proposed or vested Conservation Reserves managed by DBCA. There are no Ramsar Wetlands or Nationally Important Wetlands within the survey area (Figure 2-5).

The survey area is not located within a Public Drinking Water Source Area (listed under section 9 of the *Country Areas Water Supply Act 1947*) or a Schedule 1 area, as defined in the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Figure 2-5).

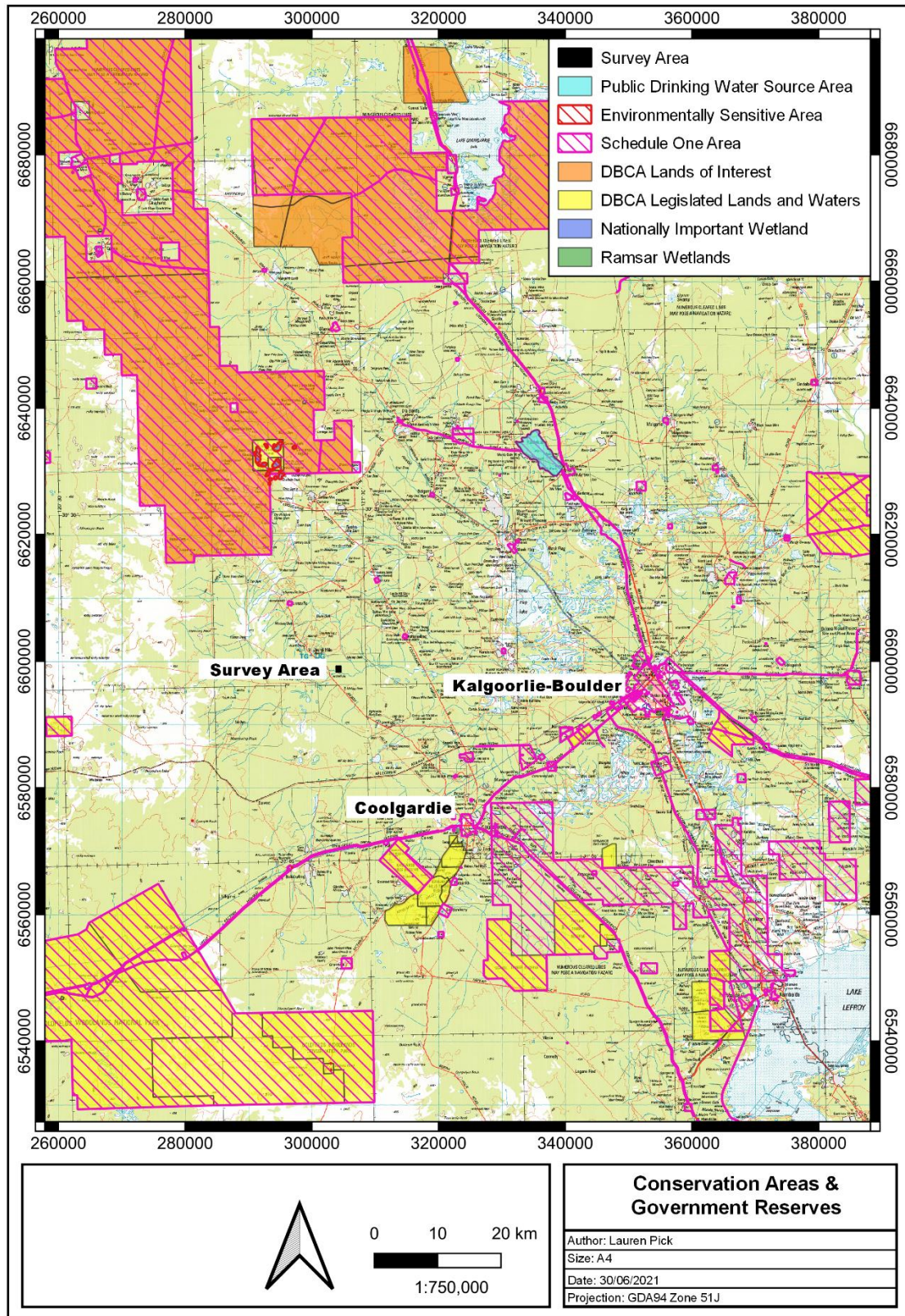


Figure 2-5: Conservation areas and government reserves in relation to the survey area

## 3 METHODOLOGY

### 3.1 DESKTOP ASSESSMENT

#### 3.1.1 LITERATURE REVIEW

A literature review was undertaken of previous flora and fauna assessments conducted for the Jaurdi Gold Project. Documents reviewed included:

- Native Vegetation Solutions (2017) Jaurdi Hills Level 2 Flora and Vegetation Survey.
- Terrestrial Ecosystems (2017). Level 1 Vertebrate Fauna Risk Assessment for Jaurdi Hills Mining Area.
- Native Vegetation Solutions (2018a). Threatened Flora and Malleefowl Mound Targeted Search: Jaurdi Gold Project Magazine Area and Access Track.
- Native Vegetation Solutions (2018b). Threatened Flora and Malleefowl Mound Targeted Search: Jaurdi Gold Project Production Borefield and Access Tracks.
- Native Vegetation Solutions (2020a). Threatened Flora and Malleefowl Mound Targeted Search: Jaurdi Gold Project - M16/560.
- Native Vegetation Solutions (2020b). Targeted Threatened Flora and Malleefowl Mound Survey - Panther Project.
- Native Vegetation Solutions (2020c). Reconnaissance Flora Survey of the Jaurdi Gold Project M16/529.
- Terrestrial Ecosystems (2020a). Vertebrate Fauna Assessment Jaurdi Gold Project M16/529.
- Terrestrial Ecosystems (2020b). Targeted Malleefowl Survey-Jaurdi Gold Project.
- Terrestrial Ecosystems (2020c). Targeted survey for Arid Bronze Azure Butterfly-Jaurdi Gold Project.

#### 3.1.2 DATABASE SEARCHES

Searches of the following databases were undertaken to aid in the compilation of a list of flora and fauna within the survey area:

- DBCA Priority/ Threatened Flora Database Search (DBCA, 2020a);
- DBCA Priority/ Threatened Ecological Communities Database Search (DBCA, 2020b);
- DBCA NatureMap Database (DBCA, 2021a); and
- DAWE Protected Matters search tool (DAWE, 2021a).

The NatureMap and Protected Matters Search were conducted for an area encompassing a 20km radius of the centre coordinates -30.7284S 120.9545E. It should be noted that these lists are based on observations from a broader area than the survey area (20km radius) and therefore may include taxa not present. The databases also often include very old records that may be incorrect or in some cases the taxa in question have become locally or regionally extinct. Information from these sources should therefore be taken as indicative only and local knowledge and information also needs to be taken into consideration when determining what actual species may be present within the specific area being investigated. The conservation significance of flora and fauna taxa was assessed using data from the following sources:

- *Environment Protection and Biodiversity and Conservation (EPBC) Act 1999*. Administered by the Australian Government (DAWE);
- *Biodiversity Conservation (BC) Act 2016*. Administered by the WA Government (DBCA);
- Red List produced by the Species Survival Commission (SSC) of the World Conservation Union (also known as the IUCN Red List – the acronym derived from its former name of the International Union for Conservation of Nature and Natural Resources). The Red List has no legislative power in Australia but is used as a framework for State and Commonwealth categories and criteria; and
- Priority Flora/ Fauna list. A non-legislative list maintained by DBCA for management purposes (fauna list released April 2019; flora list released December 2018).

### 3.2 FIELD ASSESSMENT

A reconnaissance flora/ vegetation survey and basic terrestrial fauna survey was conducted on the 26<sup>th</sup> March 2021 by two VP Environmental Pty Ltd staff members; Lauren Pick (Director, BSc-Conservation Biology & Zoology) and Bill Van Hassel (Environmental Technician). Given the small scale of impacts proposed (i.e., expansion of the existing Jaurdi Gold Project), the survey area is not located in a fragmented landscape or a conservation area and the desktop assessment identified low potential for significant habitats (i.e., widespread/ common habitats), a reconnaissance and basic survey was conducted. A detailed flora/ vegetation survey and reconnaissance fauna survey have been previously conducted within the survey area by Native Vegetation Solutions (NVS, 2017) and Terrestrial Ecosystems (2017).

As described in Section 2.2, the current survey was conducted following above average rainfall received in February and March 2021. The survey area was traversed on foot using a hand-held GPS (see Figure 3-1).



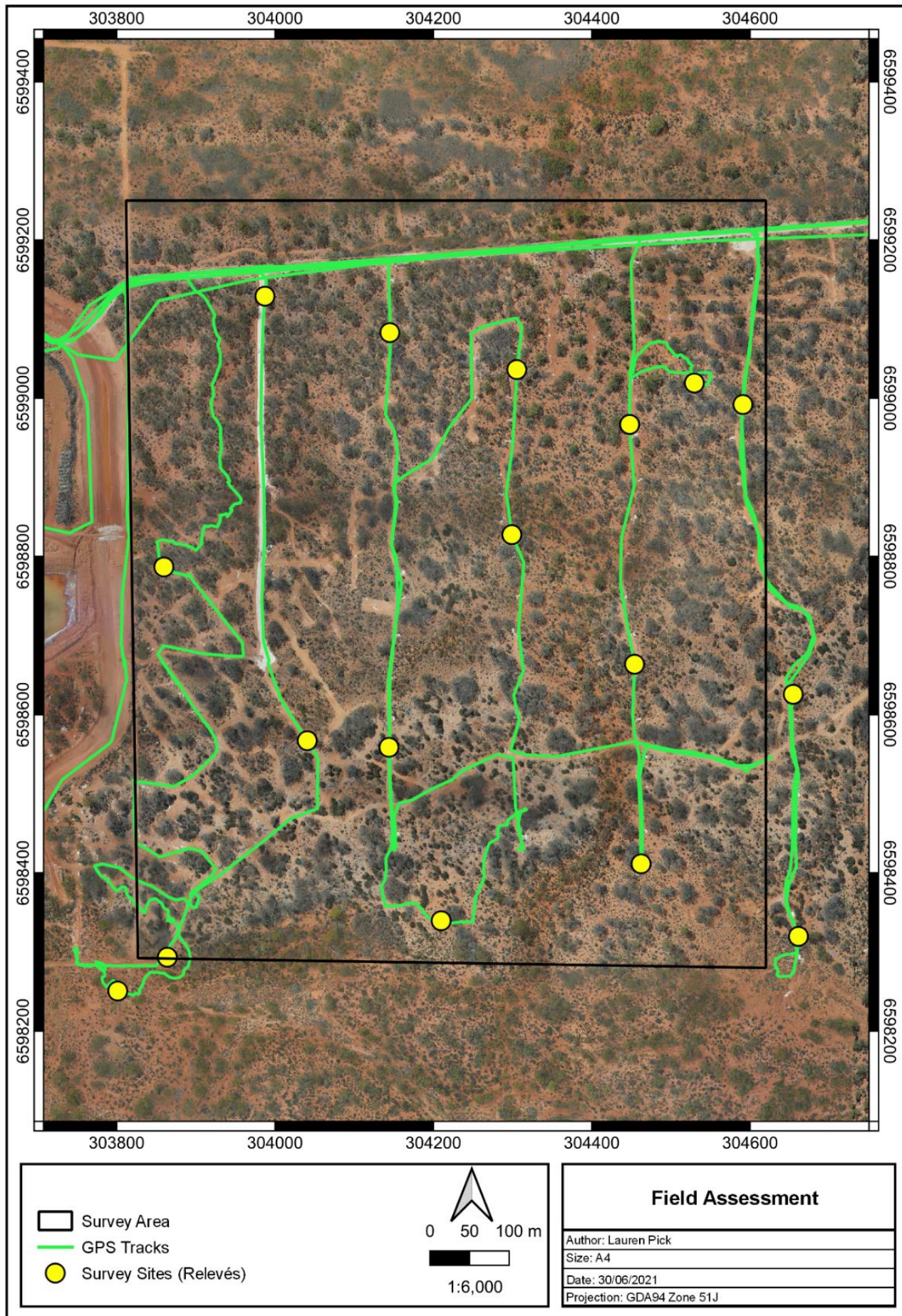


Figure 3-1: Field Assessment-GPS tracks and survey sites



### 3.2.1 FLORA AND VEGETATION SURVEY

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Prior to the commencement of field work, aerial photography was inspected and obvious differences in the vegetation assemblages were identified. The different vegetation communities identified were then inspected during the field survey to assess their validity. A handheld GPS unit was used to record the coordinates of the boundaries between vegetation communities.

Vegetation was surveyed using relevés (unmarked survey sampling areas). At each relevé site, the area was walked on foot to observe and record all flora species. The distance surveyed at each relevé varied dependent on the diversity/ variability of species and landforms/ vegetation types. Dominant species forming each stratum were recorded. Plants with unknown or uncertain identities were collected and compared with confirmed specimens housed at the WA Herbarium to ensure correct identifications. The following information was recorded at each relevé:

- Geographic coordinates (MGA94; Zone 51J);
- Photograph of vegetation type;
- Landscape description (classified in accordance Australian Soil and Land Survey Field Handbook Third Addition (CSIRO, 2009);
- Time since fire;
- Dominant taxa for each vegetation stratum;
- Height and percentage cover of dominant vascular plant species of each vegetation stratum;
- All vascular taxa (including annual and introduced taxa);
- Vegetation condition rating in accordance with classifications for the South-West Interzone classifications provided in the EPA Technical Guidelines (2016)-see Appendix 2.

A complete species list was generated from the relevé data for each of the vegetation types identified within the survey area (Appendix 3). Structural vegetation classification was used to characterise the different vegetation types. Vegetation types were described in accordance with NVIS classifications-Vegetation Types (Level V).

### 3.2.2 TERRESTRIAL FAUNA SURVEY

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Vegetation and landform units identified during the flora assessment have been used to define broad fauna habitat types across the site. This information has been supplemented with observations made during the fauna assessment.

The main aim of the fauna habitat assessment was to determine the potential for any species of conservation significance to utilise the areas that maybe impacted on as a consequence of development at the site.

As part of the desktop literature review, available information on the habitat requirements of the species of conservation significance listed as possibly occurring in the area was researched. During the field survey, the habitats within the survey area were assessed and specific elements identified, if present, to determine the likelihood of significant fauna species utilising the area and its significance to them.

Opportunistic observations of fauna species were made during all field survey work which involved a series of transects across the survey area during the day including observations of bird species with binoculars. Secondary evidence of a species presence such as tracks, scats, skeletal remains, foraging evidence or calls were also noted if observed/heard.

### 3.2.3 SURVEY LIMITATIONS AND CONSTRAINTS

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It is important to note that environmental surveys will entail limitations notwithstanding careful planning and design. Potential limitations are listed in Table 3-1 below.

The conclusions presented in this report are based upon field data and environmental assessments and/or testing carried out over a limited period of time and are therefore merely indicative of the environmental condition of the site at the time of the field assessments. Also, it should be recognised that site conditions can change with time. Information not available at the time of this assessment which may subsequently become available may alter the conclusions presented.

**Table 3-1: Limitations and constraints associated with the survey**

Variable	Potential Impact on Survey	Details
Access problems	Not a constraint	The survey was conducted via 4WD and on foot. Existing access tracks intersected the survey area providing ease of access.
Competency/ Experience	Not a constraint	The personnel that conducted and managed the survey is regarded as suitably qualified and experienced as described below: <b>Field/ Reporting:</b> Lauren Pick, Director, VP Environmental Pty Ltd <b>Qualifications:</b> Bachelor of Science (Conservation Biology and Zoology) <b>Experience:</b> Over twelve years' experience conducting flora/ vegetation and fauna surveys across Western Australia.
Timing of survey, weather & season	Minor constraint	Fieldwork was completed outside of the EPA's recommended primary survey time period (i.e., Spring) for the South-West Interzone, however the survey was conducted following above average rainfall received in February-March 2021.
Area disturbance	Not a constraint	The majority of the survey area was in good condition and comprised of native vegetation. Disturbance in the area was a result of mining/ exploration activities.
Survey Effort/ Extent	Not a constraint	Survey intensity was appropriate for the size/significance of the area with a reconnaissance flora/ vegetation survey and basic terrestrial fauna survey completed to identify vegetation types/fauna habitats and conservation significant species/communities.
Availability of contextual information at a regional and local scale	Not a constraint	Threatened flora database searches provided by the DBCA were used to identify any potential locations of Threatened/Priority species and communities.  Multiple government databases were reviewed to obtain appropriate regional desktop information on the biophysical environment of the local region.  Multiple flora and fauna surveys have been previously conducted for the Jaurdi Gold Project. Results of previous assessments in the local area were reviewed to provide context on the local environment.
Completeness	Not a constraint	The survey area was covered sufficiently in order to identify vegetation assemblages and fauna habitats. Few of the plants during the survey were in flower, however annual species present. Only one flora specimen was unable to be positively identified to species level.  The vegetation types for this study were based on visual descriptions of locations in the field. The distribution of these vegetation communities/ fauna habitats outside the survey area is not known, however vegetation types identified were categorised via comparison to vegetation distributions throughout WA specified in the NVIS Major Vegetation Groups (DotEE, 2017b).



## 4 RESULTS

### 4.1 DESKTOP ASSESSMENT

#### 4.1.1 FLORA AND VEGETATION

According to the results of the NatureMap search (DBCA, 2021a), a total of 86 flora taxa have been recorded within a 20km radius of the survey area, with *Eucalyptus* being the dominant genera (Appendix 4). Results of database searches (DBCA, 2021a; DAWE, 2021a) and literature review identified four introduced species as potentially occurring within a 20km radius of the survey area:

1. *Schinus molle* var. *areira*
2. *Carrichtera annua* (Ward's Weed)
3. *Cucumis myriocarpus* (Prickly Paddy Melon)
4. *Cylindropuntia* spp. (Pricky Pear)

One of these species; *Cylindropuntia* spp. is listed as a declared pest under the *Biosecurity and Agriculture Management Act 2007* (BAM Act) and as a Weed of National Significance (WoNS) by DAWE.

##### 4.1.1.1 CONSERVATION SIGNIFICANT FLORA

The results of the literature review, combined search of the DBCA's Threatened and Priority Flora databases (DBCA, 2020a), DBCA NatureMap Report (DBCA, 2021a) and DAWE protected matters search (DAWE, 2021a) recorded no Threatened Flora or Priority Flora within the survey area. Two Threatened Flora and five Priority Flora taxa were listed on the databases as potentially occurring within a 20km radius of the survey area (map of flora locations provided in Figure 4-1). Descriptions of suitable habitat for each taxon and likelihood of occurrence within the survey area is provided in Table 4-2. These taxa were assessed and ranked for their likelihood of occurrence within the survey area based on their distribution and known habitat in accordance with the criteria listed in Table 4-1.

**Table 4-1: Likelihood of occurrence-conservation significant flora**

Likelihood	Description
<b>Unlikely</b>	Species considered unlikely to occur include species that fit one or more of the following criteria: <ul style="list-style-type: none"><li>• Area is outside of the currently documented distribution</li><li>• have not been recorded previously in the survey area and surrounds</li><li>• rely on specific habitat types or resources that are not present in the assessment area</li><li>• are considered locally extinct</li></ul>
<b>Possible</b>	Species considered possible to occur include species that fit one or more of the following criteria: <ul style="list-style-type: none"><li>• Area is within the known distribution of the species</li><li>• have infrequently been recorded previously in the survey area and surrounds</li><li>• use habitat types or resources that are present in the assessment area, although habitats present may be of marginal quality</li><li>• are unlikely to maintain sedentary populations, however, may seasonally use resources within the study area opportunistically during variable seasons or migration</li></ul>
<b>Likely</b>	Species considered likely to occur include species that fit one or more of the following criteria: <ul style="list-style-type: none"><li>• have frequently been recorded previously in the survey area and surrounds</li><li>• use habitat types or resources that are present in the assessment area, that are abundant and/or in good condition within the assessment area</li></ul>
<b>Known to occur</b>	Species was positively identified as being present during previous field surveys/ listed on the DBCA database.

**Table 4-2: Conservation significant flora within 20km of the survey area**

Taxon	EPBC Act	BC Act	DBCA Priority Rating	Habitat Description (DBCA record, 2021a)	Habitat Description- Florabase (DBCA, 2021b)	Likelihood of occurrence
<i>Eremophila praecox</i>	-	-	P2	Low plain. red/brown loam Moist	Red/brown sandy loam. Undulating plains	Possible Within species range-recorded by Native Vegetation Solutions (2020c), approximately 1km north-west of survey area, habitat may be present.
<i>Eucalyptus educta</i>	-	-	P2	Not available	Shallow soils. Granite rocks	Unlikely At extreme of known range, habitat unlikely to be present. No available DBCA records within 20km of the survey area.
<i>Gastrolobium graniticum</i>	EN	VU	-	Granite Rocks	Sand, sandy loam, granite. Margins of rock outcrops, along drainage lines.	Unlikely Outside of known range, habitat unlikely to be present. The closest known DBCA record of this species is located approximately 33km south-west of the survey area (recorded in 2009).
<i>Gompholobium cinereum</i>	-	-	P3	Gentle undulations, yellow sand over laterite	Yellow sand, clayey sand, brown loam, sandy gravel, laterite. Well-drained open sites, slopes, plains, roadsides	Possible Within known range, habitat may be present. The closest known DBCA record of this species is located approximately 7.5km north-east of the survey area (recorded in 1993).
<i>Hakea rigida</i>	-	-	P2	Sand on rise	Sandy soils, yellow sand	Unlikely At extreme of known range, habitat unlikely to be present. The closest known DBCA record of this species is located approximately 17km south-east of the survey area (recorded in 1990).
<i>Phebalium appressum</i>	-	-	P1	Mid slope between mallee woodland and sandplain heath. Brown sandy loam.	Yellow sandplain	Unlikely At extreme of known range, habitat unlikely to be present. The closest known DBCA record of this species is located approximately 12.5km south-east of the survey area (recorded in 2011).
<i>Thelymitra stellata</i>	EN	EN	-	Not available	Sand, gravel, lateritic loam	Unlikely Outside of known range, habitat unlikely to be present. No available DBCA records within 20km of the survey area. Current known records are located within Geraldton Sandplains, Jarrah Forest, Swan Coastal Plain.

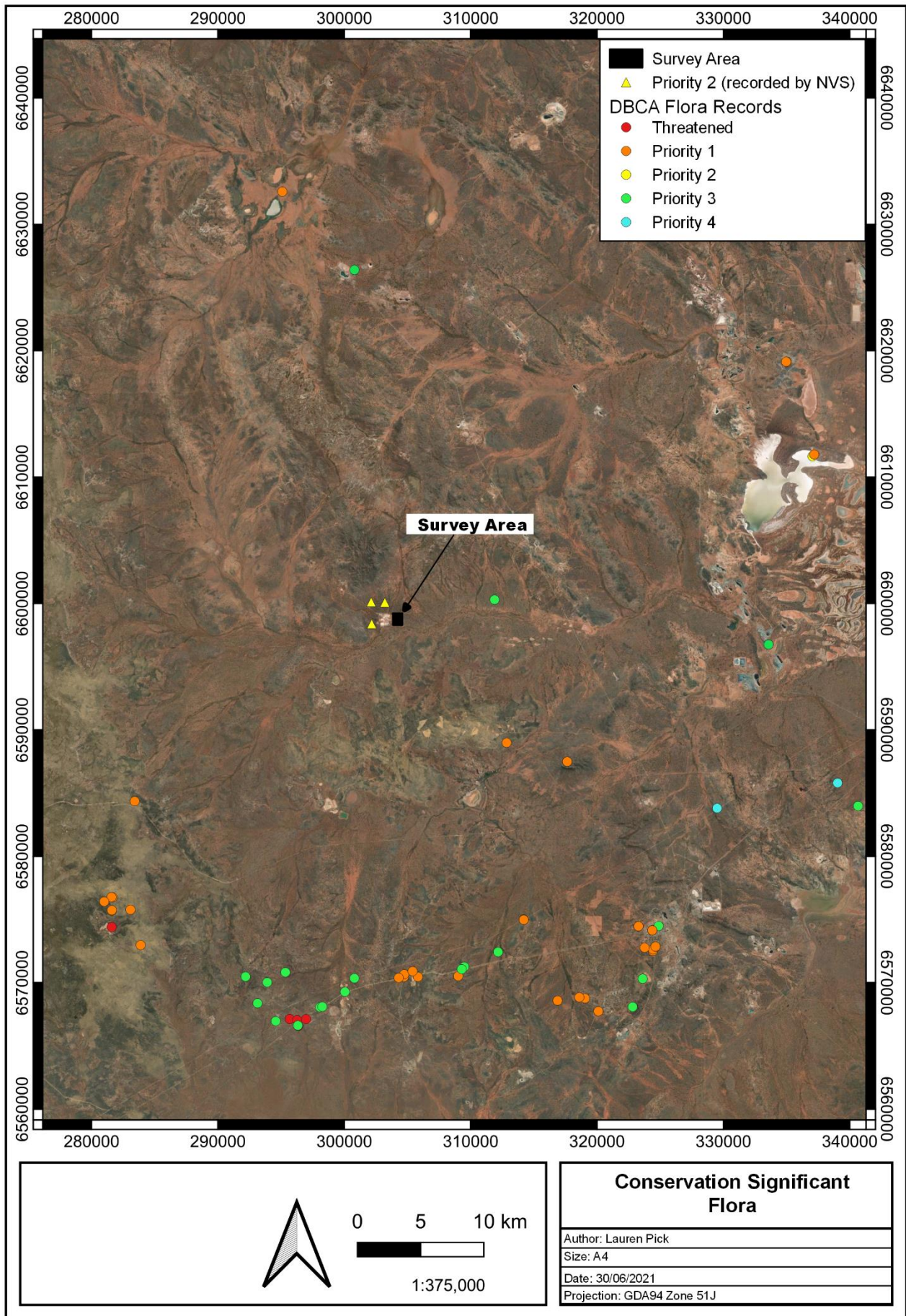


Figure 4-1: Conservation significant flora in relation to the survey area



#### 4.1.1.2 CONSERVATION SIGNIFICANT VEGETATION

The results of the literature review, combined search of the DBCA's Threatened and Priority Ecological Communities database (DBCA, 2021b), and DAWE protected matters search (DAWE, 2021a) recorded no Threatened Ecological Communities (TEC) or Priority Ecological Community (PEC) as occurring within a 50km radius of the survey area.

#### 4.1.2 TERRESTRIAL FAUNA

According to the results of the NatureMap search (DBCA, 2021a), a total of 92 vertebrate fauna taxa have been recorded within a 20km radius of the survey area including 68 bird species, 1 amphibian, 3 mammals and 20 reptiles (Appendix 4). Combined results of database searches and literature review identified twelve introduced taxa as potentially occurring within the survey area, these being:

1. *Canis lupus familiaris* (Dog)
2. *Capra hircus* (Goat)
3. *Columba livia* (Rock Pigeon)
4. *Equus asinus* (Donkey)
5. *Equus caballus* (Horse)
6. *Felis catus* (Cat)
7. *Hemidactylus frenatus* (Asian House Gecko)
8. *Mus musculus* (House Mouse)
9. *Oryctolagus cuniculus* (Rabbit)
10. *Streptopelia chinensis* (Spotted Turtle-Dove)
11. *Streptopelia senegalensis* (Laughing Turtle-Dove)
12. *Vulpes vulpes* (Red Fox)

#### 4.1.2.1 CONSERVATION SIGNIFICANT FAUNA

The results of the literature review, combined NatureMap search (DBCA, 2021a) and DAWE protected matters search (DAWE, 2021a) recorded five Threatened Fauna, three Migratory Fauna and four Priority Fauna as potentially occurring within 20km radius of the survey area. Descriptions of each taxon and indication of potentially suitable habitat within the survey area for each taxon is provided in Table 4-4. These taxa were assessed and ranked for their likelihood of occurrence within the survey area based on their distribution and known habitat in accordance with the criteria listed in Table 4-3 below.

**Table 4-3: Likelihood of occurrence-conservation significant fauna**

Likelihood	Description
<b>Unlikely</b>	Species considered unlikely to occur include species that fit one or more of the following criteria: <ul style="list-style-type: none"> <li>• Area is outside of the currently documented distribution</li> <li>• have not been recorded previously in the survey area and surrounds</li> <li>• rely on specific habitat types or resources that are not present in the assessment area</li> <li>• are considered locally extinct</li> </ul>
<b>Possible</b>	Species considered possible to occur include species that fit one or more of the following criteria: <ul style="list-style-type: none"> <li>• Area is within the known distribution of the species</li> <li>• have infrequently been recorded previously in the survey area and surrounds</li> <li>• use habitat types or resources that are present in the assessment area, although habitats present is of marginal quality</li> <li>• are unlikely to maintain sedentary populations, however, may seasonally use resources within the study area opportunistically during variable seasons or migration</li> </ul>

Likelihood	Description
<b>Likely</b>	Species considered likely to occur include species that fit one or more of the following criteria: <ul style="list-style-type: none"> <li>• have frequently been recorded previously in the survey area and surrounds</li> <li>• use habitat types or resources that are present in the assessment area, that are abundant and/or in good condition within the assessment area</li> <li>• are known or likely to maintain resident populations surrounding the assessment area</li> <li>• are known or likely to visit the site during regular seasonal movements or migration.</li> </ul>
<b>Known to occur</b>	Species was positively identified as being present during previous field surveys/ listed on the DBCA database.

**Table 4-4: Conservation significant fauna within 20km of the survey area**

Taxon	EPBC Act	BC Act	DBCA Priority	Habitat Description	Likelihood of occurrence
Curlew Sandpiper <i>Calidris ferruginea</i>	CR	CR	-	The Curlew Sandpiper is found on intertidal mudflats of estuaries, lagoons, mangroves, as well as beaches, rocky shores and around lakes, dams and floodwaters (Birdlife Australia, 2021).	Unlikely No suitable habitat.
Peregrine Falcon <i>Falco peregrinus</i>	-	OS	-	The Peregrine Falcon is found in most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites, and prefers coastal and inland cliffs or open woodlands near water, and may even be found nesting on high city buildings (Birdlife Australia, 2018).	Possible May occur aerially over survey area but unlikely to breed in the area.
Grey Falcon <i>Falco hypoleucos</i>	-	VU	-	The species frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses. The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter (DAWE, 2021b).	Unlikely No suitable habitat.
Night Parrot <i>Pezoporus occidentalis</i>	EN	CR	-	Broad habitat requirements include areas of old-growth spinifex ( <i>Triodia</i> ) for roosting and nesting, together with foraging habitats that are likely to include various native grasses and herbs, and may or may not contain shrubs or low trees. (DPaW, 2017).	Unlikely No suitable habitat and no known records within the goldfields region.
Migratory Shorebirds (Various species)	MI	IA	-	Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline salt lakes inland (DAWE, 2020).	Unlikely No suitable habitat.
Malleefowl <i>Leipoa ocellata</i>	VU	VU	-	Scrublands and woodlands dominated by mallee and wattle species (DotEE 2019).	Possible Occasional transients may be present in the local region however habitat appears very marginal/or unsuitable for breeding supported by lack of observations during previous fauna surveys and targeted surveys conducted for the Jaurdi Gold Project.
Grey Wagtail <i>Motacilla cinerea</i>	MI	IA	-	Running water in disused quarries, sandy, rocky streams in escarpments and rainforest, sewerage ponds, ploughed fields and airfields (Morecombe 2004).	Unlikely No suitable habitat and no known records within the goldfields region.
Fork-tailed Swift <i>Apus pacificus</i>	MI	IA	-	In Australia, they mostly occur over inland plains but sometimes above foothills or in coastal areas. They often occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas,	Unlikely Very small number of historic records in vicinity. Very occasional transients/flyover only.



Taxon	EPBC Act	BC Act	DBCA Priority	Habitat Description	Likelihood of occurrence
				including towns, urban areas and cities. They mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. They are also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. They sometimes occur above rainforests, wet sclerophyll forest or open forest or plantations of pines (Higgins 1999).	
Western Rosella <i>Platycercus icterotis xanthogenys</i>	-	-	P4	Mainly eucalypt and casuarina woodlands and scrubs (Johnstone and Storr, 1998).	Possible Habitat may be present and the survey area is located within the potential distribution range.
Chuditch <i>Dasyurus geoffroii fortis</i>	VU	VU	-	Historically, chuditch inhabited a wide range of habitats, but today it survives mostly in Jarrah <i>Eucalyptus marginata</i> forests and woodlands, mallee shrublands and heathlands (DBCA, 2017).	Unlikely. Generally regarded as locally extinct.
Central Long-eared Bat <i>Nyctophilus major tor</i>	-	-	P3	Appears to prefer heavy eucalypt woodlands and tall woodlands with a tall shrub understorey. Less common in open woodlands.	Possible Habitat may be present and the survey area is located within the potential distribution range.
Arid Bronze Azure Butterfly <i>Ogyris subterrestris petrina</i>	CR	CR	-	Restricted to mallee vegetation on sandy soil, often near flood plains, in which nests of the associated ant are established at the base of eucalypts (DotEE, 2015). DBCA advice indicates the host ant ( <i>Camponotus terebrans</i> ) is known to favour smooth bark <i>Eucalyptus</i> species, such as <i>Eucalyptus salmonophloia</i> and <i>Eucalyptus salubris</i> , however the host ant is sporadically distributed across southern Australia and floristically diverse habitats are needed to sustain high densities of the host ant (DotEE, 2015).	Unlikely Previous targeted surveys conducted for the Jaurdi Gold Project by Terrestrial Ecosystems (2020c) recorded no evidence (i.e., not host ant or butterfly observations) of the Arid Bronze Azure Butterfly.  Publicly only known to be extant at two locations within the Wheatbelt Region and is presumed extinct at another location within the Goldfields Region (Lake Douglas-45km south-east of the survey area). Survey area has been subject to previous mining/ exploration and is unlikely to provide floristically diverse habitat. The survey area has been subject to soil disturbance which adversely affects the host ant (DotEE, 2015).

## 4.2 FIELD ASSESSMENT

### 4.2.1 FLORA AND VEGETATION

#### 4.2.1.1 FLORA

A total of 18 families and 70 taxa were identified within the survey area including one introduced species and five annual taxa. The total species list is provided in Appendix 3.

One introduced species was identified within the survey area; *Cucumis myriocarpus* (Prickly Paddy Melon). This taxon is not listed as a declared pest under the BAM Act or a WoNS by DAWE. This species was identified at a single location (51J 303867 6598290).



**Plate 4-1: *Cucumis myriocarpus* (Prickly Paddy Melon)**

#### 4.2.1.2 VEGETATION TYPES

Four vegetation types were identified within the survey area (Table 4-5). These vegetation types comprised of three landform types and three NVIS Major Vegetation Groups (MVG). Vegetation types are shown spatially in Figure 4-2.









Figure 4-2: Vegetation types within the survey area



Table 4-5: Vegetation types within the survey area

Vegetation Code	Landform	Major Vegetation Group	Description	Image	Extent within survey area
CLP-EW1	Clay-Loam Plain	Eucalypt Woodlands (MVG 5)	Mid woodland of <i>Eucalyptus salmonophloia</i> over mid shrubland of <i>Eremophila scoparia</i> / <i>Senna artemisioides</i> subsp. <i>filifolia</i> over low shrubland of <i>Grevillea acuaria</i> on clay-loam plain		19 ha (24.7%)
CLP-MWS1	Clay-Loam Plain	Mallee Woodlands and Shrublands (MVG 14)	Low mallee woodland of <i>Eucalyptus oleosa</i> subsp. <i>oleosa</i> / <i>E. griffithsii</i> over mid shrubland of <i>Eremophila caperata</i> / <i>E. interstans</i> subsp. <i>virgata</i> and low open shrubland of <i>Olearia muelleri</i> on clay-loam plain		18.5 ha (24.0%)

Vegetation Code	Landform	Major Vegetation Group	Description	Image	Extent within survey area
OD-OS1	Open Depression	Other Shrublands (MVG 17)	Mid closed shrubland of <i>Cratystylis subspinescens</i> over low shrubland of <i>Frankenia interioris</i> in open depression		0.5 ha (0.6%)
RS-EW1	Rocky Slope	Eucalypt Woodlands (MVG 5)	Low woodland of <i>Eucalyptus clelandiorum</i> over tall shrubland of <i>Melaleuca sheathiana</i> and low open shrubland of <i>Cratystylis conocephala</i> / <i>Maireana triptera</i> / <i>Westringia rigida</i> on calcrete rise		36 ha (46.8%)
CV	N/A	N/A	Cleared Vegetation (excluding exploration disturbance)	No image available	3 ha (3.9%)
<b>TOTAL</b>					<b>77 ha</b>

#### 4.2.1.3 VEGETATION CONDITION

Based on the vegetation condition rating scale for the South-West Interzone specified by EPA (2016c) (Appendix 2), vegetation ranged from 'good' to 'very good' (Table 4-6 and Figure 4-3). Disturbances recorded within the survey area included access roads, mining infrastructure (borefields) and introduced species. There was no evidence of recent fire disturbance within the survey area.

**Table 4-6: Vegetation condition within the survey area**

Vegetation Condition Rating	Description (EPA, 2016c)	Extent within survey area
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing	15 ha (19.5%)
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing	59 ha (76.6%)
Cleared Vegetation		3 ha (3.9%)
<b>TOTAL</b>		<b>77 ha</b>





**Figure 4-3: Vegetation condition within the survey area**

#### 4.2.1.4 SIGNIFICANT FLORA

According to the EPA *Environmental Factor Guideline for Flora and Vegetation* (EPA, 2016a) significant flora includes:

- flora being identified as Threatened or Priority species;
- locally endemic flora or flora associated with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems);
- new species or anomalous features that indicate a potential new species;
- flora representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range);
- unusual species, including restricted subspecies, varieties or naturally occurring hybrids; and
- flora with relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape.

No Threatened Flora taxa listed under Commonwealth or State legislation were identified within the survey area. No Priority Flora taxa listed by DBCA were identified during the survey or are known to occur within the survey area (DBCA, 2021a). No other significant flora (i.e. endemic, new or anomalous species, range extension, relictual or unusual species) were identified within the survey area.

#### 4.2.1.5 SIGNIFICANT VEGETATION

According to the EPA *Environmental Factor Guideline for Flora and Vegetation* (EPA, 2016b) significant vegetation includes:

- vegetation being identified as Threatened or Priority Ecological Communities;
- vegetation with restricted distribution;
- vegetation subject to a high degree of historical impact from threatening processes;
- vegetation which provides a role as a refuge; and
- vegetation providing an important function required to maintain ecological integrity of a significant ecosystem.

No Threatened Ecological Communities listed under Commonwealth or State legislation were identified within the survey area. No Priority Ecological Communities listed by DBCA were identified during the survey or are known to occur within the survey area (DBCA, 2021b). No other significant vegetation (i.e., restricted vegetation, highly disturbed vegetation, vegetation providing important refuge or significant ecological function) was identified within the survey area.

### 4.2.2 TERRESTRIAL FAUNA




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#### 4.2.2.1 FAUNA HABITATS

Three broad fauna habitat types were identified which generally correspond to the described vegetation communities. These habitats are described in Table 4-7 and are shown in Figure 4-4.



**Table 4-7: Fauna habitats within the survey area**

Fauna Habitat	Description	Fauna Habitat Attributes	Potential Conservation Significant species	Image
<p>Clay-Loam Plain: Eucalypt Woodland/ Mallee Woodland</p> <p>Extent: 37.5 ha (48.7%)</p>	<p>Clay loam plain comprising a mosaic of Salmon Gum woodland and mixed Mallee woodland over mixed low shrubs</p>	<ul style="list-style-type: none"> <li>• Range of vegetation strata suitable to a variety of passerine and nonpasserine birds.</li> <li>• Moderate to high leaf litter in areas of mature woodland.</li> <li>• Relatively dense shrubs providing cover for small fauna.</li> <li>• Ground not especially suited to burrowing species.</li> </ul>	<p>Malleefowl <i>Leipoa ocellata</i></p> <p>Peregrine Falcon <i>Falco peregrinus</i></p> <p>Western Rosella (Inland ssp) <i>Platycercus icterotis xanthogenys</i></p> <p>Central Long-eared Bat <i>Nyctophilus major tor</i></p>	
<p>Calcrete Rise: Eucalypt Woodland</p> <p>Extent: 36 ha (46.8%)</p>	<p>Calcrete rise comprising of Cleland's blackbutt woodland over moderately dense Melaleuca tall shrubland and mixed low open shrubs</p>	<ul style="list-style-type: none"> <li>• Moderate to high leaf litter in areas of mature woodland.</li> <li>• Limited vegetation strata.</li> <li>• Limited dense shrubs.</li> <li>• Dominated by rocky substrate less suitable for burrowing.</li> </ul>	<p>Peregrine Falcon <i>Falco peregrinus</i></p> <p>Central Long-eared Bat <i>Nyctophilus major tor</i></p>	
<p>Open Depression: Other Shrubland</p> <p>Extent: 0.5 ha (0.6%)</p>	<p>Clay-open depression comprising of low dense shrubs over low forbs/ chenopods</p>	<ul style="list-style-type: none"> <li>• Halopyte vegetation providing potential food source.</li> <li>• Limited vegetation strata supporting a lower avifauna assemblage.</li> <li>• Limited leaf litter due to absence of trees</li> <li>• Substrate moderately suited to a variety of burrowing small mammals and reptiles.</li> </ul>	<p>Peregrine Falcon <i>Falco peregrinus</i></p>	





**Figure 4-4: Fauna habitats within the survey area**

#### 4.2.2.2 SIGNIFICANT FAUNA

According to the EPA *Environmental Factor Guideline for Terrestrial Fauna* (EPA, 2016d) significant fauna includes:

- Fauna being identified as a Threatened or Priority species;
- Fauna species with restricted distribution;
- Fauna subject to a high degree of historical impact from threatening processes; and
- Fauna providing an important function required to maintain the ecological integrity of a significant ecosystem.

No Threatened Fauna taxa listed under Commonwealth or State legislation were identified within the survey area. No Priority Fauna taxa listed by DBCA were identified during the fauna survey or are known to occur within the survey area. No other significant fauna (described above) were confirmed as occurring within the survey area. The current status of some species on site and/or in the general area is difficult to determine, however, based on the habitats present and/ or recent nearby records, the following species of conservation significance can be regarded as possibly utilising the survey area for some purpose at times, these being:

- **Malleefowl *Leipoa ocellata* – Vulnerable (EPBC Act and BC Act)**

No evidence (i.e., individuals, nest mounds, footprints) of the species presence was observed during the current field survey and there are known records available on the DBCA database or recorded during previous surveys of the Jaurdi Gold Project. The closest known record of Malleefowl, recorded in 1985 is located approximately 4.5km north-west of the survey area. Available information therefore suggests that a breeding population of this species is very unlikely to be present in the general area, though transient, non-breeding individuals may occasionally occur.

- **Peregrine Falcon *Falco peregrinus* – Other Specially Protected Species (BC Act)**

This species potentially occurs aerially over the survey area as part of a much larger home range, though records in this area are rare and therefore it is likely to be only occasionally present. No potential nest sites observed.

- **Western Rosella *Platycercus icterotis xanthogenys* – P4 (DBCA Priority Species)**

The survey area contains potential suitable habitat (Eucalypt woodland) for this species to use for foraging and possibly roosting. It would however appear to be uncommon given the lack of documented records in the local region. This species was not observed during the survey.

- **Central Long-eared Bat *Nyctophilus major tor* – P3 (DBCA Priority Species)**

The survey area contains potential suitable habitat (Eucalypt woodland) for this species to use for foraging and possibly roosting. It would however appear to be uncommon given the lack of documented records in the local region.

It should be noted that while habitats onsite for the species listed above are considered possibly suitable, some or all may be marginal in extent/quality and therefore the fauna species considered as possibly occurring may in fact only visit the area for short periods as infrequent vagrants.



## 5 ENVIRONMENTAL LEGISLATION

An assessment of the survey findings against relevant Commonwealth and State environmental legislation is provided in the following sections.

### 5.1 COMMONWEALTH LEGISLATION

#### 5.1.1 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The EPBC Act protects matters of national environmental significance, and is used by the Commonwealth DAWE to list threatened taxa and ecological communities into categories based on the criteria set out in the Act ([www.environment.gov.au/epbc/index.html](http://www.environment.gov.au/epbc/index.html)). The Act provides a national environmental assessment and approval system for proposed developments and enforces strict penalties for unauthorised actions that may affect matters of national environmental significance. Matters of national environmental significance as defined by the Commonwealth EPBC Act include:

- Nationally threatened flora species;
- 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 ecological communities;
- Commonwealth marine area;
- The Great Barrier Reef Marine Park; and
- Nuclear actions (including uranium mining) a water resource, in relation to coal seam gas development and large coal mining development.

No matters of national environmental significance as defined by the Commonwealth EPBC Act were identified within the survey area.

### 5.2 STATE LEGISLATION

#### 5.2.1 ENVIRONMENTAL PROTECTION ACT WA 1986

The EP Act provides for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment. The Act is administered by The Department of Water and Environment Regulation (DWER), which is the State Government's environmental regulatory agency.

Under Section 51C of the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations (Regulations) WA 2004* any clearing of native vegetation in Western Australia that is not eligible for exemption under Schedule 6 of the *EP Act 1986* or under the Regulations 2004 requires a clearing permit from the DWER or DMIRS. Under Section 51A of the *EP Act 1986* native vegetation includes aquatic and terrestrial vegetation indigenous to Western Australia, and intentionally planted vegetation declared by regulation to be native vegetation, but not vegetation planted in a plantation or planted with commercial intent. Section 51A of the *EP Act 1986* defines clearing as "the killing or destruction of; the removal of; the severing or ringbarking of trunks or stems of; or the doing of substantial damage to some or all of the native vegetation in an area, including the flooding of land, the burning of vegetation, the grazing of stock or an act or activity that results in the above". Exemptions under Schedule 6 of the EP Act and the EP Regulations do not apply in Environmentally Sensitive Areas (ESA) as declared under Section 51B of the EP Act or TEC listed under State and Commonwealth legislation.

No evidence of the survey area containing any TEC or Threatened Flora or Fauna was identified during the survey. The survey area is not located within an ESA.



## 5.2.2 BIODIVERSITY CONSERVATION ACT 2016

This Act has been established for the conservation and protection of biodiversity and biodiversity components in Western Australia and to promote the ecologically sustainable use of biodiversity components in the State. Taxa are classified as ‘Threatened’ when their populations are geographically restricted or are threatened by local processes (see following sections for Threatened definitions). Under this Act all native flora and fauna are protected throughout the State. Financial penalties are enforced under this Act if threatened species are collected without an appropriate licence.

Under Section 54(1) of the BC Act, habitat is eligible for listing as critical habitat if:

- (a) it is critical to the survival of a threatened species or a threatened ecological community; and
- (b) its listing is otherwise in accordance with the ministerial guidelines.

No threatened species or critical habitat listed under the BC Act were recorded within the survey area.

## 5.3 NATIVE VEGETATION CLEARING PRINCIPLES

Based on the outcomes from the survey, an assessment of the proposed clearing against the native vegetation clearing principles listed under Schedule 5 of the EP Act was conducted as summarised in Table 5-1. The assessment identified that clearing may be at variance with clearing principle f. The proposed clearing is not at variance or unlikely to be at variance with all remaining clearing principles.

**Table 5-1: Native Vegetation Clearing Principles Assessment**

Letter	Principle	Assessment	Outcome
	<b>Native vegetation should not be cleared if it:</b>		
(a)	comprises a high level of biological diversity.	Vegetation identified within the survey area is not considered to be of high biological diversity and is well represented in the local area.	Clearing is unlikely to be at variance to this principle
(b)	comprises the whole or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to WA.	No significant fauna were observed within the survey area. The survey area comprises of broad fauna habitats that are typical of those in the wider region. No unique fauna habitats (caves, rocky outcrops/ pools etc.) occur within the survey area.	Clearing is unlikely to be at variance to this principle
(c)	includes, or is necessary for the continued existence of rare flora.	No Threatened Flora taxa, pursuant to the BC Act and the EPBC Act were identified within the survey area.	Clearing is not at variance to this principle
(d)	comprises the whole or part of or is necessary for the maintenance of a threatened ecological community (TEC).	No TEC listed under the EPBC Act or by the BC Act occur within the survey area.	Clearing is not at variance to this principle
(e)	is significant as a remnant of native vegetation in an area that has been extensively cleared	The survey area occurs within the pre-European Beard vegetation association Boorabbin 8 which retains >99% of the original pre-European vegetation extent.	Clearing is unlikely to be at variance to this principle
(f)	is growing, in, or in association with, an environment associated with a watercourse or wetland	There are no inland waters (lakes/ playas) within the survey area. An ephemeral drainage line intersects the far south-western corner of the survey area. Vegetation within the locality of the ephemeral drainage line comprised of clay-loam plain <i>E. salmonophloia</i> woodland vegetation.	Clearing may be at variance to this principle
(g)	Native vegetation should not be cleared if the clearing of the vegetation is likely to	The survey area occurs within the pre-European Beard vegetation association Boorabbin 8 which retains >99% of the original pre-European	Clearing is unlikely to be at variance to this principle

Letter	Principle	Assessment	Outcome
	Native vegetation should not be cleared if it: cause appreciable land degradation.	vegetation extent. Clearing within these vegetation associations is not likely to lead to land degradation issues such as salinity, water logging or acidic soils.	
(h)	Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	The survey area is not located within a proposed or vested conservation area. The closest conservation reserves are the Clear and Muddy Lakes Nature Reserve and the Rowles Lagoon Conservation Park, which are located approximately 31km north of the survey area. Given the distance of the survey area from these conservation areas, clearing within the survey area is unlikely to impact the environmental values of these reserves.	Clearing is unlikely to be at variance to this principle
(i)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.	There are no inland waters (lakes/ playas) within the survey area. An ephemeral drainage line intersects the far south-western corner of the survey area. Vegetation within the locality of the ephemeral drainage line comprised of clay-loam plain <i>E. salmonophloia</i> woodland vegetation.  Most rainfall is lost by evaporation or surface runoff. Only a small portion infiltrates the soil and recharges the groundwater.	Clearing is unlikely to be at variance to this principle
(j)	Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding	Rainfall is unreliable and highly variable with an average rainfall for Kalgoorlie-Boulder of approximately 266mm and an evaporation rate of 2400mm. The region is not prone to flooding and does not contain perennial water sources.	Clearing is unlikely to be at variance to this principle

## 6 DISCUSSION

Four vegetation types were identified within the survey area which were represented by a total of 18 families and 70 taxa. Vegetation types identified were common and widespread with no unique vegetation types identified. None of the vegetation types were identified as being significant, including no vegetation representative of Threatened Ecological Communities listed under State or Commonwealth legislation or Priority Ecological Communities listed by DBCA. No significant flora was identified within the survey area including no Threatened flora listed under State or Commonwealth legislation or Priority flora listed by DBCA. Previous flora/ vegetation surveys conducted within the survey area did not identify any significant flora or vegetation within the survey area.

The survey area comprises of three broad fauna habitats that are typical of habitat in the wider region. No unique fauna habitats (caves, rocky outcrops/ pools etc.) occur within the survey area. No significant fauna were observed within the survey area, including no Threatened fauna or Migratory fauna listed under State or Commonwealth legislation or Priority fauna listed by DBCA. Previous fauna surveys conducted within the survey area did not observe any significant fauna within the survey area. Given the locality of the survey area adjacent to active mining of the Jaurdi Gold Project and habitats are represented outside of the survey area, vegetation clearing in the survey area is unlikely to have a significant impact on any conservation significant fauna.



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## Appendix 1: Conservation Codes for Threatened and Priority species and communities

Code	Category
<b>State categories of Threatened and Priority species</b>	
<b>Threatened Species (T)</b>	
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).	
CR	<p><b>Critically Endangered</b></p> <p>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”.</p> <p>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.</p>
EN	<p><b>Endangered</b></p> <p>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”.</p> <p>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.</p>
VU	<p><b>Vulnerable</b></p> <p>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”.</p> <p>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.</p>
<b>Extinct species</b>	
Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.	
EX	<p><b>Extinct</b></p> <p>Species where “<i>there is no reasonable doubt that the last member of the species has died</i>”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).</p> <p>Published as presumed extinct under schedule 4 of the <i>Wildlife Conservation (Specially Protected Fauna) Notice 2018</i> for extinct fauna or the <i>Wildlife Conservation (Rare Flora) Notice 2018</i> for extinct flora.</p>
EW	<p><b>Extinct in the Wild</b></p> <p>Species that “<i>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</i>”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).</p> <p>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.</p>
<b>Specially protected species</b>	
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.	



Code	Category
IA	<p><b>International Agreement/ Migratory</b></p> <p>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).</p> <p>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 <i>Convention on the Conservation of Migratory Species of Wild Animals</i> (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.</p> <p>Published as migratory birds protected under an international agreement under schedule 5 of the <i>Wildlife Conservation (Specially Protected Fauna) Notice 2018</i>.</p>
CD	<p><b>Species of special conservation interest</b></p> <p>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).</p> <p>Published as conservation dependent fauna under schedule 6 of the <i>Wildlife Conservation (Specially Protected Fauna) Notice 2018</i>.</p>
OS	<p><b>Other specially protected species</b></p> <p>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).</p> <p>Published as other specially protected fauna under schedule 7 of the <i>Wildlife Conservation (Specially Protected Fauna) Notice 2018</i>.</p>
<p><b>Priority species</b></p> <p>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.</p> <p>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.</p> <p>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.</p>	
P1	<p><b>Priority 1: Poorly-known species</b></p> <p>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.</p>
P2	<p><b>Priority 2: Poorly-known species</b></p> <p>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.</p>
P3	<p><b>Priority 3: Poorly-known species</b></p> <p>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.</p>

Code	Category
P4	<p><b>Priority 4: Rare, Near Threatened and other species in need of monitoring</b></p> <p>(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.</p> <p>(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.</p> <p>(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</p>
<b>Commonwealth categories of Threatened species</b>	
EX	<p><b>Extinct</b></p> <p>Taxa where there is no reasonable doubt that the last member of the species has died.</p>
EW	<p><b>Extinct in the Wild</b></p> <p>Taxa where it 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.</p>
CR	<p><b>Critically Endangered</b></p> <p>Taxa that are facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.</p>
EN	<p><b>Endangered</b></p> <p>Taxa which are not critically endangered and is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.</p>
VU	<p><b>Vulnerable</b></p> <p>Taxa which are 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.</p>
CD	<p><b>Conservation Dependent</b></p> <p>Taxa which are 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:</p> <p>(i) the species is a species of fish;</p> <p>(ii) the species is the focus of a plan of management that provides for 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;</p> <p>(iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory;</p> <p>(iv) cessation of the plan of management would adversely affect the conservation status of the species.</p>

Category Code	Category
<b>State categories of Threatened Ecological Communities (TEC)</b>	
PD	<p><b>Presumed Totally Destroyed</b></p> <p>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:</p> <ul style="list-style-type: none"> <li>records within the last 50 years have not been confirmed despite thorough searches or known likely habitats or;</li> <li>all occurrences recorded within the last 50 years have since been destroyed.</li> </ul>
	<p><b>Critically Endangered</b></p> <p>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, meeting any one of the following criteria:</p> <p>The estimated geographic range and distribution has been reduced by at least 90% and is either continuing to decline with total destruction imminent, or is unlikely to be substantially rehabilitated in the immediate future due to modification;</p>

Category Code	Category
	The current distribution is limited i.e. highly restricted, having very few small or isolated occurrences, or covering a small area;
	The ecological community is highly modified with potential of being rehabilitated in the immediate future.
EN	<b>Endangered</b>
	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. The ecological community must meet any one of the following criteria:
	The estimated geographic range and distribution has been reduced by at least 70% and is either continuing to decline with total destruction imminent in the short-term future, or is unlikely to be substantially rehabilitated in the short-term future due to modification;
	The current distribution is limited i.e. highly restricted, having very few small or isolated occurrences, or covering a small area;
	The ecological community is highly modified with potential of being rehabilitated in the short-term future.
VU	<b>Vulnerable</b>
	An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing high risk of total destruction in the medium to long term future. The ecological community must meet any one of the following criteria:
	The ecological community exists largely as modified occurrences that are likely to be able to be substantially restored or rehabilitated;
	The ecological community may already be modified and would be vulnerable to threatening process, and restricted in range or distribution;
	The ecological community may be widespread but has potential to move to a higher threat category due to existing or impending threatening processes.
<b>Commonwealth categories of Threatened Ecological Communities (TEC)</b>	
CE	<b>Critically Endangered</b> If, at that time, an ecological community is facing an extremely high risk of extinction in the wild in the immediate future (indicative timeframe being the next 10 years).
EN	<b>Endangered</b> If, at that time, an ecological community is not critically endangered but is facing a very high risk of extinction in the wild in the near future (indicative timeframe being the next 20 years).
VU	<b>Vulnerable</b> If, at that time, an ecological community is not critically endangered or endangered, but is facing a high risk of extinction in the wild in the medium-term future (indicative timeframe being the next 50 years).
<b>Priority Ecological Communities (PEC)</b>	
P1	<b>Poorly-known ecological communities</b>
	Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist.
P2	<b>Poorly-known ecological communities</b>
	Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, un-allocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation.
P3	<b>Poorly known ecological communities</b>
	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: Communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or;



Category Code	Category
	Communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing and inappropriate fire regimes.
P4	<b>Ecological communities that are adequately known, rare but not threatened</b> or meet criteria for near threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.
P5	<p data-bbox="359 448 1406 510"><b>Conservation Dependent ecological communities</b></p> <p data-bbox="359 510 1406 600">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.</p>

## Appendix 2: Vegetation Condition Scale (EPA, 2016)

Vegetation Condition Rating	South West and Interzone Botanical Provinces	Eremaean and Northern Botanical Provinces
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.	/
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	/	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely Degraded	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 and shrubs.	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

### Appendix 3: Flora species list

Family	Taxon	CLP-EW1	CLP-MWS1	OD-OS1	RS-EW1
Amaranthaceae	<i>Ptilotus exaltatus</i> (A)	*			*
	<i>Ptilotus obovatus</i>				*
Apocynaceae	<i>Alyxia buxifolia</i>		*		*
Asparagaceae	<i>Lomandra effusa</i>				*
Asteraceae	<i>Cratystylis conocephala</i>		*		*
	<i>Cratystylis subspinescens</i>	*		*	
	<i>Jacksonia arida</i>			*	
	<i>Olearia muelleri</i>	*	*		*
Chenopodiaceae	<i>Atriplex nummularia</i> subsp. <i>spathulata</i>	*	*		*
	<i>Atriplex vesicaria</i>				*
	<i>Enchylaena tomentosa</i>	*		*	
	<i>Eriochiton sclerolaenoides</i>	*			
	<i>Maireana georgei</i>	*			
	<i>Maireana pentatropis</i>	*		*	*
	<i>Maireana tomentosa</i>				*
	<i>Maireana trichoptera</i>	*			
	<i>Maireana triptera</i>	*			*
	<i>Rhagodia drummondii</i>	*			
	<i>Rhagodia eremaea</i>				*
	<i>Salsola australis</i> (A)			*	
	<i>Sclerolaena cuneata</i>	*			
	<i>Sclerolaena densiflora</i>			*	
	<i>Sclerolaena diacantha</i>	*		*	*
<i>Sclerolaena eurotioides</i>	*				
<i>Sclerolaena patentiscuspis</i>	*		*		
Cucurbitaceae	<i>Cucumis myriocarpus</i> (W)	*			
Fabaceae	<i>Acacia acuminata</i>				*
	<i>Acacia colletioides</i>	*			*
	<i>Acacia erinacea</i>			*	
	<i>Acacia hemiteles</i>	*	*		*
	<i>Acacia merrallii</i>		*		*
	<i>Senna artemisioides</i> subsp. <i>filifolia</i>	*	*		*
	<i>Senna artemisioides</i> subsp. x <i>artemisioides</i>	*	*		*
Frankeniaceae	<i>Frankenia cinerea</i>			*	
	<i>Frankenia interioris</i>	*		*	
Goodeniaceae	<i>Goodenia collaris</i>				*
	<i>Scaevola spinescens</i>	*	*		*
Hemerocallidaceae	<i>Dianella revoluta</i>	*			*
Lamiaceae	<i>Westringia rigida</i>		*		*
Myrtaceae	<i>Eucalyptus campaspe</i>	*	*		
	<i>Eucalyptus celastroides</i>				*
	<i>Eucalyptus clelandiorum</i>		*		*
	<i>Eucalyptus gracilis</i>		*		
	<i>Eucalyptus griffithsii</i>		*		
	<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>		*		
	<i>Eucalyptus salmonophloia</i>	*	*		
	<i>Eucalyptus salubris</i>	*			
	<i>Eucalyptus yilgarnensis</i>		*		
	<i>Melaleuca sheathiana</i>				*
Poaceae	<i>Austrostipa</i> sp. (sterile)		*		
Proteaceae	<i>Grevillea acuaria</i>	*			
Santalaceae	<i>Exocarpos aphyllus</i>	*	*		*
	<i>Exocarpos sparteus</i>	*			



Family	Taxon	CLP-EW1	CLP-MWS1	OD-OS1	RS-EW1
	<i>Santalum acuminatum</i>	*	*		
Scrophulariaceae	<i>Eremophila caperata</i>	*	*		
	<i>Eremophila dempsteri</i>	*			
	<i>Eremophila interstans</i> subsp. <i>virgata</i>	*	*		
	<i>Eremophila ionantha</i>	*	*		
	<i>Eremophila maculata</i>	*	*	*	
	<i>Eremophila pantonii</i>	*			
	<i>Eremophila parvifolia</i> subsp. <i>auricampi</i>	*	*		*
	<i>Eremophila scoparia</i>	*	*	*	*
	<i>Eremophila</i> sp. Mt Jackson (G.J. Keighery 4372)	*	*		
Solanaceae	<i>Lycium australe</i>	*			
	<i>Solanum hoplopetalum</i> (A)				*
	<i>Solanum nummularium</i>			*	*
	<i>Solanum orbiculatum</i>			*	*
Zygophyllaceae	<i>Roepera eremaea</i> (A)				*
	<i>Roepera ovata</i> (A)		*		

Blue text (A)-indicates annual taxa; Green text (W)-indicates introduced taxa

## Appendix 4: NatureMap and Protected Matters Search Results

# NatureMap Species Report

Created by Guest user on 05/03/2021

**Current Names Only** Yes  
**Core Datasets Only** Yes  
**Method** 'By Circle'  
**Centre** 120° 57' 16" E, 30° 43' 42" S  
**Buffer** 20km  
**Group By** Species Group

Species Group	Species	Records
Amphibian	1	2
Bird	68	333
Bryopsid (Moss)	2	3
Dicotyledon	80	105
Gymnosperm	1	2
Invertebrate	2	2
Lichen	4	5
Mammal	3	4
Monocotyledon	5	7
Reptile	20	53
Slime Mould	7	13
<b>TOTAL</b>	<b>193</b>	<b>529</b>

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
<b>Amphibian</b>				
1.	25427 <i>Neobatrachus sutor</i> (Shoemaker Frog)			
<b>Bird</b>				
2.	24559 <i>Acanthagenys rufogularis</i> (Spiny-cheeked Honeyeater)			
3.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
4.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
5.	24265 <i>Acanthiza uropygialis</i> (Chestnut-rumped Thornbill)			
6.	25544 <i>Aegotheles cristatus</i> (Australian Owllet-nightjar)			
7.	24312 <i>Anas gracilis</i> (Grey Teal)			
8.	24315 <i>Anas rhynchotis</i> (Australasian Shoveler)			
9.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
10.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
11.	24266 <i>Aphelocephala leucopsis</i> subsp. <i>castaneiventris</i> (Southern Whiteface)			
12.	24610 <i>Ardeotis australis</i> (Australian Bustard)			
13.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
14.	<i>Barnardius zonarius</i>			
15.	24319 <i>Biziura lobata</i> (Musk Duck)			
16.	24779 <i>Calidris acuminata</i> (Sharp-tailed Sandpiper)		IA	
17.	24784 <i>Calidris ferruginea</i> (Curlew Sandpiper)		T	
18.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)		IA	
19.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
20.	47909 <i>Cheramoeca leucosterna</i> (White-backed Swallow)			
21.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
22.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
23.	24416 <i>Corvus bennetti</i> (Little Crow)			
24.	25592 <i>Corvus coronoides</i> (Australian Raven)			
25.	24671 <i>Coturnix pectoralis</i> (Stubble Quail)			
26.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
27.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
28.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
29.	24322 <i>Cygnus atratus</i> (Black Swan)			
30.	24606 <i>Daphoenositta chrysoptera</i> subsp. <i>pileata</i> (Varied Sittella, Black-capped Sittella)			
31.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
32.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
33.	<i>Egretta novaehollandiae</i>			
34.	<i>Eolophus roseicapillus</i>			
35.	24567 <i>Epthianura albifrons</i> (White-fronted Chat)			
36.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			



Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
37.	25623 <i>Falco longipennis</i> (Australian Hobby)			
38.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
39.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
40.	24557 <i>Leipoa ocellata</i> (Malleefowl)		T	
41.	25659 <i>Lichenostomus leucotis</i> (White-eared Honeyeater)			
42.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
43.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
44.	25652 <i>Malurus leucopterus</i> (White-winged Fairy-wren)			
45.	24551 <i>Malurus pulcherrimus</i> (Blue-breasted Fairy-wren)			
46.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
47.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
48.	25663 <i>Melithreptus brevirostris</i> (Brown-headed Honeyeater)			
49.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
50.	25693 <i>Microeca fascians</i> (Jacky Winter)			
51.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
52.	24618 <i>Oreoica gutturalis</i> (Crested Bellbird)			
53.	24619 <i>Pachycephala inornata</i> (Gilbert's Whistler)			
54.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
55.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
56.	48060 <i>Petrochelidon ariel</i> (Fairy Martin)			
57.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
58.	24659 <i>Petroica goodenovii</i> (Red-capped Robin)			
59.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
60.	24681 <i>Poliiocephalus poliocephalus</i> (Hoary-headed Grebe)			
61.	24683 <i>Pomatostomus superciliosus</i> (White-browed Babbler)			
62.	42344 <i>Pumella albifrons</i> (White-fronted Honeyeater)			
63.	24278 <i>Pyrrholaemus brunneus</i> (Redthroat)			
64.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
65.	30948 <i>Smicrornis brevirostris</i> (Weebill)			
66.	25597 <i>Strepera versicolor</i> (Grey Currawong)			
67.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
68.	24331 <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
69.	24808 <i>Tringa nebularia</i> (Common Greenshank, greenshank)		IA	

### Bryopsid (Moss)

70.	32427 <i>Rosulabryum capillare</i>			
71.	32438 <i>Syntrichia pagorum</i>			

### Dicotyledon

72.	3315 <i>Acacia duriuscula</i>			
73.	3366 <i>Acacia hemiteles</i>			
74.	3378 <i>Acacia inaequiloba</i>			
75.	3495 <i>Acacia prainii</i> (Prain's Wattle)			
76.	3514 <i>Acacia resinistipulea</i>			
77.	15292 <i>Acacia yorkrakinensis</i> subsp. <i>acrita</i>			
78.	2369 <i>Amyema benthamii</i>			
79.	2453 <i>Atriplex codonocarpa</i> (Flat-topped Saltbush)			
80.	12042 <i>Atriplex lindleyi</i> subsp. <i>inflata</i>			
81.	1815 <i>Banksia elderiana</i> (Swordfish Banksia)			
82.	4409 <i>Boronia coerulescens</i>			
83.	4445 <i>Boronia ternata</i>			
84.	4999 <i>Brachychiton gregorii</i> (Desert Kurrajong, Ngalta)			
85.	19437 <i>Brachysola coerulea</i>			
86.	12658 <i>Casuarina pauper</i> (Black Oak)			
87.	15611 <i>Conospermum stoechadis</i> subsp. <i>stoechadis</i> (Common Smokebush)			
88.	16183 <i>Cryptandra aridicola</i>			
89.	6747 <i>Cyanostegia angustifolia</i> (Tinsel-flower)			
90.	6751 <i>Cyanostegia microphylla</i> (Tinsel Flower)			
91.	7438 <i>Dampiera eriocephala</i> (Woolly-headed Dampiera)			
92.	7480 <i>Dampiera tenuicaulis</i> (Slender-stemmed Dampiera)			
93.	41025 <i>Dasymalla terminalis</i> (Native Foxglove)			
94.	3813 <i>Daviesia grahamii</i>			
95.	6771 <i>Dicrastylis parvifolia</i>			
96.	4752 <i>Dodonaea adenophora</i>			
97.	4753 <i>Dodonaea amblyophylla</i>			
98.	4769 <i>Dodonaea lobulata</i> (Bead Hopbush)			
99.	2510 <i>Enchylaena lanata</i>			
100.	17162 <i>Eremophila subfloccosa</i> subsp. <i>lanata</i>			
101.	5581 <i>Eucalyptus campaspe</i> (Silver Gimlet)			
102.	48436 <i>Eucalyptus clelandiorum</i>			
103.	13097 <i>Eucalyptus educta</i>			

P2

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
104.	5641 <i>Eucalyptus ewartiana</i> (Ewart's Mallee)			
105.	5665 <i>Eucalyptus griffithsii</i> (Griffith's Grey Gum)			
106.	13056 <i>Eucalyptus leptopoda</i> subsp. <i>subluta</i>			
107.	19323 <i>Eucalyptus moderata</i>			
108.	5726 <i>Eucalyptus oleosa</i> (Giant Mallee)			
109.	18580 <i>Eucalyptus planipes</i>			
110.	12380 <i>Eucalyptus ravidia</i> (Silver-topped Gimlet)			
111.	5761 <i>Eucalyptus rigidula</i> (Stiff-leaved Mallee)			
112.	12693 <i>Eucalyptus salicola</i> (Salt Gum)			
113.	46628 <i>Eucalyptus</i> sp. Southern smooth-bark (D. Nicolle & M. French DN 6916)			
114.	5792 <i>Eucalyptus torquata</i> (Coral Gum)			
115.	18293 <i>Eucalyptus urna</i>			
116.	16722 <i>Euryomyrtus maidenii</i>			
117.	29285 <i>Gompholobium cinereum</i>		P3	
118.	10777 <i>Gompholobium gompholobioides</i>			
119.	1971 <i>Grevillea cagiana</i> (Red Toothbrushes)			
120.	8832 <i>Grevillea excelsior</i> (Flame Grevillea)			
121.	2104 <i>Grevillea teretifolia</i> (Round Leaf Grevillea)			
122.	2184 <i>Hakea multilineata</i> (Grass Leaf Hakea)			
123.	16047 <i>Hakea rigida</i>		P2	
124.	6776 <i>Hemiphora elderi</i> (Red Velvet)			
125.	5815 <i>Homalocalyx thryptomenoides</i>			
126.	7397 <i>Isotoma petraea</i> (Rock Isotome, Tundiwari)			
127.	7569 <i>Lechenaultia brevifolia</i>			
128.	6401 <i>Leucopogon hamulosus</i>			
129.	2544 <i>Maireana georgei</i> (Satiny Bluebush)			
130.	19380 <i>Melaleuca calyptroides</i>			
131.	4099 <i>Mirbelia seorsifolia</i>			
132.	19587 <i>Monotaxis grandiflora</i> var. <i>obtusifolia</i>			
133.	8145 <i>Olearia pimeleoides</i> (Pimelea Daisybush, Burrobunga)			
134.	46313 <i>Orianthera flaviflora</i>			
135.	46253 <i>Orianthera tortuosa</i>			
136.	3674 <i>Petalostylis cassioides</i>			
137.	2308 <i>Petrophile seminuda</i>			
138.	16621 <i>Phebalium appressum</i>		P1	
139.	4497 <i>Phebalium canaliculatum</i>			
140.	18506 <i>Philothea tomentella</i>			
141.	5231 <i>Pimelea angustifolia</i> (Narrow-leaved Pimelea)			
142.	6812 <i>Pityrodia lepidota</i>			
143.	4701 <i>Ricinocarpos stylosus</i>			
144.	17056 <i>Schinus molle</i> var. <i>areira</i>	Y		
145.	7685 <i>Stylidium arenicola</i>			
146.	4220 <i>Swainsona canescens</i> (Grey Swainsona)			
147.	4530 <i>Tetratheca efoliata</i>			
148.	4737 <i>Tripterococcus brunonis</i> (Winged Stackhousia)			
149.	38061 <i>Verreauxia dyeri</i> (Hairy Verreauxia)			
150.	6073 <i>Verticordia chrysantha</i>			
151.	6109 <i>Verticordia picta</i> (Painted Featherflower)			
<b>Gymnosperm</b>				
152.	96 <i>Callitris preissii</i> (Rottnest Island Pine, Maro)			
<b>Invertebrate</b>				
153.	<i>Anidiops villosus</i>			
154.	<i>Cormocephalus bungalbinensis</i>			
<b>Lichen</b>				
155.	48911 <i>Aspicilia contorta</i>			
156.	27725 <i>Diploschistes thunbergianus</i>			
157.	27825 <i>Lecidea ochroleuca</i>			
158.	29984 <i>Xanthoparmelia paratasmatica</i>			Y
<b>Mammal</b>				
159.	24223 <i>Mus musculus</i> (House Mouse)	Y		
160.	24229 <i>Notomys mitchellii</i> (Mitchell's Hopping-mouse)			
161.	24194 <i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)			
<b>Monocotyledon</b>				
162.	44509 <i>Austrostipa</i> sp. Mt Burgess (A.A. Mitchell & P.J. Waddell 10499)			Y
163.	30797 <i>Caladenia saxicola</i>			
164.	15400 <i>Cyanicula amplexans</i>			
165.	1195 <i>Juncus subsecundus</i> (Finger Rush)			
166.	20732 <i>Thelymitra petrophila</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
<b>Reptile</b>				
167.	24873 <i>Ctenophorus fordii</i> (Mallee Sand Dragon)			
168.	24874 <i>Ctenophorus isolepis</i> subsp. <i>citrinus</i> (Yellowy Military Dragon)			
169.	24886 <i>Ctenophorus reticulatus</i> (Western Netted Dragon)			
170.	25026 <i>Ctenotus atlas</i>			
171.	25074 <i>Ctenotus schomburgkii</i>			
172.	25080 <i>Ctenotus uber</i> subsp. <i>uber</i> (Spotted Ctenotus)			
173.	24995 <i>Delma australis</i>			
174.	25247 <i>Demansia psammophis</i> subsp. <i>psammophis</i> (Yellow-faced Whipsnake)			
175.	25094 <i>Egernia formosa</i>			
176.	25104 <i>Egernia richardi</i>			
177.	25109 <i>Eremiascincus richardsonii</i> (Broad-banded Sand Swimmer)			
178.	24959 <i>Gehyra variegata</i>			
179.	25115 <i>Hemiergis initialis</i> subsp. <i>initialis</i>			
180.	42408 <i>Hesperoedura reticulata</i>			
181.	24961 <i>Heteronotia binoei</i> (Bynoe's Gecko)			
182.	<i>Lerista kingi</i>			
183.	25162 <i>Lerista picturata</i>			
184.	42411 <i>Lerista timida</i>			
185.	25190 <i>Morethia butleri</i>			
186.	24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
<b>Slime Mould</b>				
187.	38964 <i>Arcyria cinerea</i>			
188.	38987 <i>Comatricha ellae</i>			
189.	39027 <i>Echinostelium apitectum</i>			
190.	39030 <i>Enerthenema papillatum</i>			
191.	39041 <i>Licea kleistobolus</i>			
192.	39059 <i>Perichaena vermicularis</i>			
193.	39068 <i>Physarum decipiens</i>			

**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

<sup>1</sup> For NatureMap's purposes, species flagged as endemic are those whose records are wholly 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.





# 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: 05/03/21 15:43:56

[Summary](#)

[Details](#)

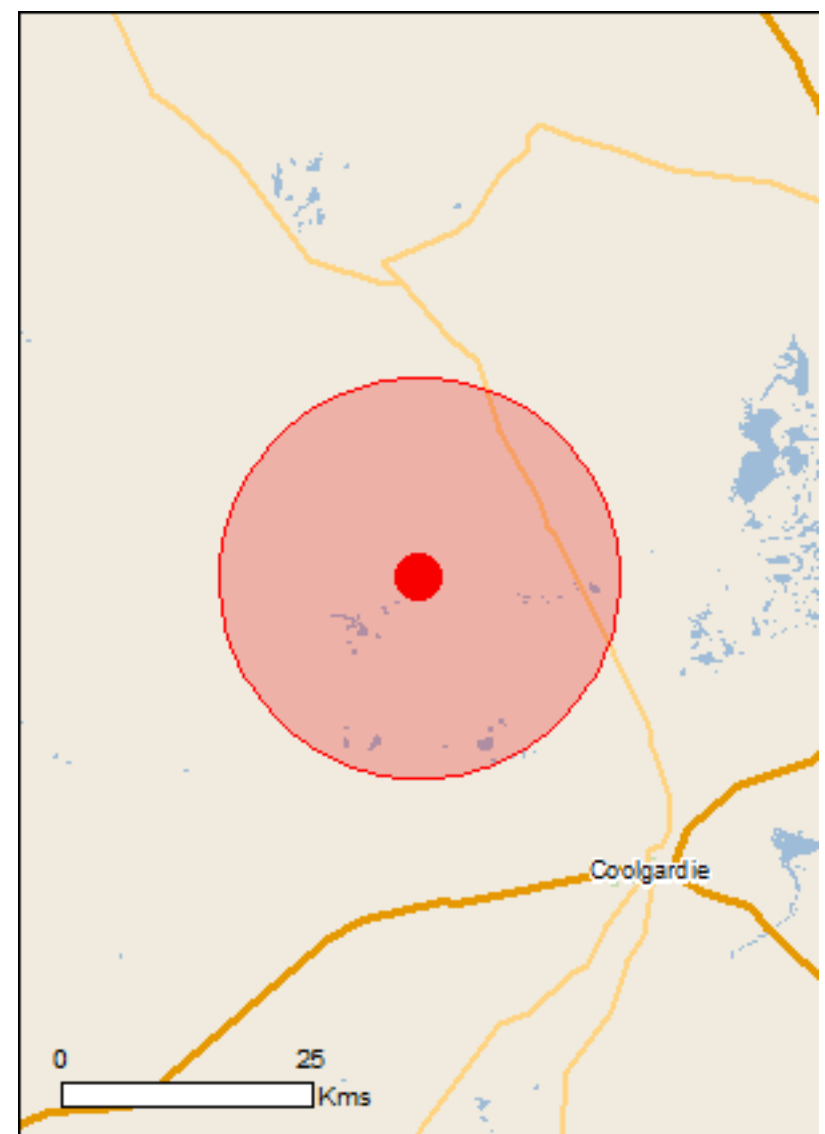
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are  
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[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](#).

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	None
<a href="#">Listed Threatened Species:</a>	7
<a href="#">Listed Migratory Species:</a>	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.

<a href="#">Commonwealth Land:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	11
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	None
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	14
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">Key Ecological Features (Marine)</a>	None

# Details

## Matters of National Environmental Significance

### Listed Threatened Species [\[ Resource Information \]](#)

Name	Status	Type of Presence
------	--------	------------------

#### Birds

<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
---	-----------------------	--

<a href="#">Falco hypoleucos</a> Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
---	------------	--

<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area
---	------------	---

<a href="#">Pezoporus occidentalis</a> Night Parrot [59350]	Endangered	Species or species habitat may occur within area
--	------------	--

#### Mammals

<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area
---	------------	--

#### Plants

<a href="#">Gastrolobium graniticum</a> Granite Poison [14872]	Endangered	Species or species habitat may occur within area
---	------------	--

<a href="#">Thelymitra stellata</a> 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

<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
---	--	--

#### Migratory Terrestrial Species

<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
---	--	--

#### Migratory Wetlands Species

<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
--	--	--



Name	Threatened	Type of Presence
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

## Other Matters Protected by the EPBC Act

### 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
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Chrysococcyx osculans</a> Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Thinornis rubricollis</a> Hooded Plover [59510]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

## Extra Information

### 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 Resources Audit, 2001.

Name	Status	Type of Presence
<b>Birds</b>		
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
<b>Mammals</b>		
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
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

Name	Status	Type of Presence
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
<b>Plants</b>		
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
<b>Reptiles</b>		
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

-30.7284 120.9545



# 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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