MT MAGNET GOLD PROJECT

Detailed Flora and Vegetation Survey and Basic Fauna Assessment

Prepared for Ramelius Resources Limited
February 2025

Prepared by
BOTANICA CONSULTING
33 Brewer St PERTH WA 6000 | 0419 916 034

Document Information

Prepared for: Ramelius Resources Ltd
Project Name: Mt Magnet Gold Project
Tenements:
Job Reference: Detailed Flora and Vegetation Survey and Basic Fauna Assessment
Job Number: 2023/102; 2024/141
Date: 1 February 2025
Version: Final

Disclaimer

Quality Assurance

An internal quality review process has been implemented to each project task undertaken by BC. Each document and its contents are carefully reviewed by core members of the Consultancy team and signed off at Director Level prior to issue to the client. Draft documents are submitted to the client for comment and acceptance prior to final production.

Cover Photo: Mulga Woodland within the Mt Magnet survey area. Taken 25 May 2024.

Prepared by: Jennifer Jackson
Senior Environmental Consultant
Botanica Consulting Pty Ltd

Reviewed by: Andrea Williams
Director
Botanica Consulting Pty Ltd

Approved by: Jim Williams
Director
Botanica Consulting Pty Ltd

Contents

Tables

Figures

EXECUTIVE SUMMARY

Botanica Consulting Pty Ltd (Botanica) was commissioned by Ramelius Resources Ltd (Ramelius) to undertake a detailed flora and vegetation survey and basic fauna assessment of the Mt Magnet Gold Project area (referred to as the 'survey area') to support an application for a clearing permit and other related approvals. The total survey area is approximately 8,357 ha and is located immediately north and west of Mount Magnet, Western Australia.

The survey area is located within the Murchison Bioregion as defined by the Interim Biogeographic Regionalisation of Australia (IBRA). The survey area is in the Shire of Mount Magnet.

Botanica conducted a detailed flora and vegetation survey and a basic fauna assessment of the survey area on the 25th to the 28th May 2024. The area was traversed using a four-wheel drive vehicle and on foot by Jennifer Jackson (Senior Botanist, BSc Environmental Management (Honours)) and Amy Johnston (Field Technician). Three small areas were added to the original survey area after May 2024, and these were surveyed on the 8th November 2024 and the 16th December 2024.

Eleven vegetation types were identified within the survey area. These vegetation types were identified within five landform types and comprised of three major vegetation groups, which were represented by a total of 28 families, 49 genera and 100 taxa. Six species of introduced flora were observed in the survey area.

Based on the vegetation condition rating scale specified in the Environmental Protection Authority (EPA) *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment – December 2016* (EPA, 2016a), vegetation was rated as 'completely degraded' to 'very good'. Disturbances in the area were a result of previous mining/exploration and pastoral land use.

No Threatened Flora or Threatened Ecological Communities as listed under the Western Australian *Biodiversity Conservation* (BC) *Act 2016* or Commonwealth *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999* were identified within the survey area.

Four Priority Flora taxa were identified within the survey area. No Priority Ecological Communities were identified within the survey area.

There was no evidence of conservation significant fauna observed in the survey area.

There are no Ramsar wetlands of international importance or sites listed in the Directory of Important Wetlands (DIWA), wetlands identified as nationally important, within the survey area nor any proposed or gazetted conservation reserves within the survey area.

Based on the outcomes from the survey undertaken, Botanica assessed the results of the desktop and field survey with regards to the native vegetation clearing principles listed under Schedule 5 of the *Environmental Protection* (EP Act) *1986*. The assessment found that the proposed vegetation clearing activities may be at variance with clearing principle (f).

1 INTRODUCTION

Botanica Consulting Pty Ltd (Botanica) was commissioned by Ramelius Resources Ltd (Ramelius) to undertake a detailed flora and vegetation survey and basic fauna assessment of the Mt Magnet Gold Project area (referred to as the 'survey area') to support an application for a clearing permit and other related approvals. The survey area is approximately 8,357 ha and is located immediately north and west of Mount Magnet, Western Australia.

1.1 Objectives

The flora and vegetation assessment was conducted in accordance with the requirements of a detailed survey as defined in *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment – December 2016* (EPA, 2016a). The objectives of the assessment were to:

- Define and map vegetation communities of the survey area to a scale appropriate for the bioregion and described according to the National Vegetation Information System (NVIS) classification (NVIS Level III– Vegetation Association);
- Record the species composition (abundance and diversity) of each vegetation community within the survey area and compile a species list for the survey area by vegetation type;
- Provide quadrat-based data from plots representative of each vegetation type (minimum of three quadrats per vegetation type) according to EPA guidelines;
- Assess the species composition of each quadrat using statistical analysis (PATN analysis);
- Determine the local and regional conservation significance of flora and vegetation within the survey area;
- Identify and record the locations of any conservation significant flora/vegetation within the survey area;
- Identify and record the locations of any introduced flora species (including Declared Plants) within the survey area;
- Provide a map showing the distribution of conservation significant flora/vegetation within the survey area;
- Define and map the condition of vegetation within the survey area in accordance with the vegetation condition rating scale specified in the Technical Guidance (EPA, 2016a);
- Determine the State legislative context of environmental aspects required for the assessment; and
- Assess Matters of National Environmental Significance (MNES) and indicate whether potential impacts on MNES as protected under the EPBC Act are likely to require referral of the project to the Commonwealth Department of (DCCEEW).

The fauna assessment was conducted in accordance with the requirements of a basic terrestrial fauna survey as defined in *Technical Guidance - Terrestrial Fauna Surveys for Environmental Impact Assessment – June 2020* (EPA, 2020). The objectives of the assessment were to:

- Undertake a literature review, including map-based information searches of all current and relevant literature sources and databases relating to the survey area;
- Undertake a desktop investigation to identify any previously recorded occurrences of or potentially occurring Threatened and Priority listed fauna within the survey area;
- Undertake searches on available databases for details relating to any Threatened and Priority listed fauna previously identified as occurring or potentially occurring within the survey area;
- Conduct fauna habitat mapping and identify habitat types which are suitable for each significant fauna considered likely or possible to occur, or fauna recorded in the survey area;
- Compile an inventory of fauna species occurrences within the survey area;
- Undertake opportunistic, low intensity sampling of fauna; and
- Report on the conservation status of species present using the Western Australian Museum and EPBC Act databases for presence of Threatened and Priority listed fauna species within the survey area.

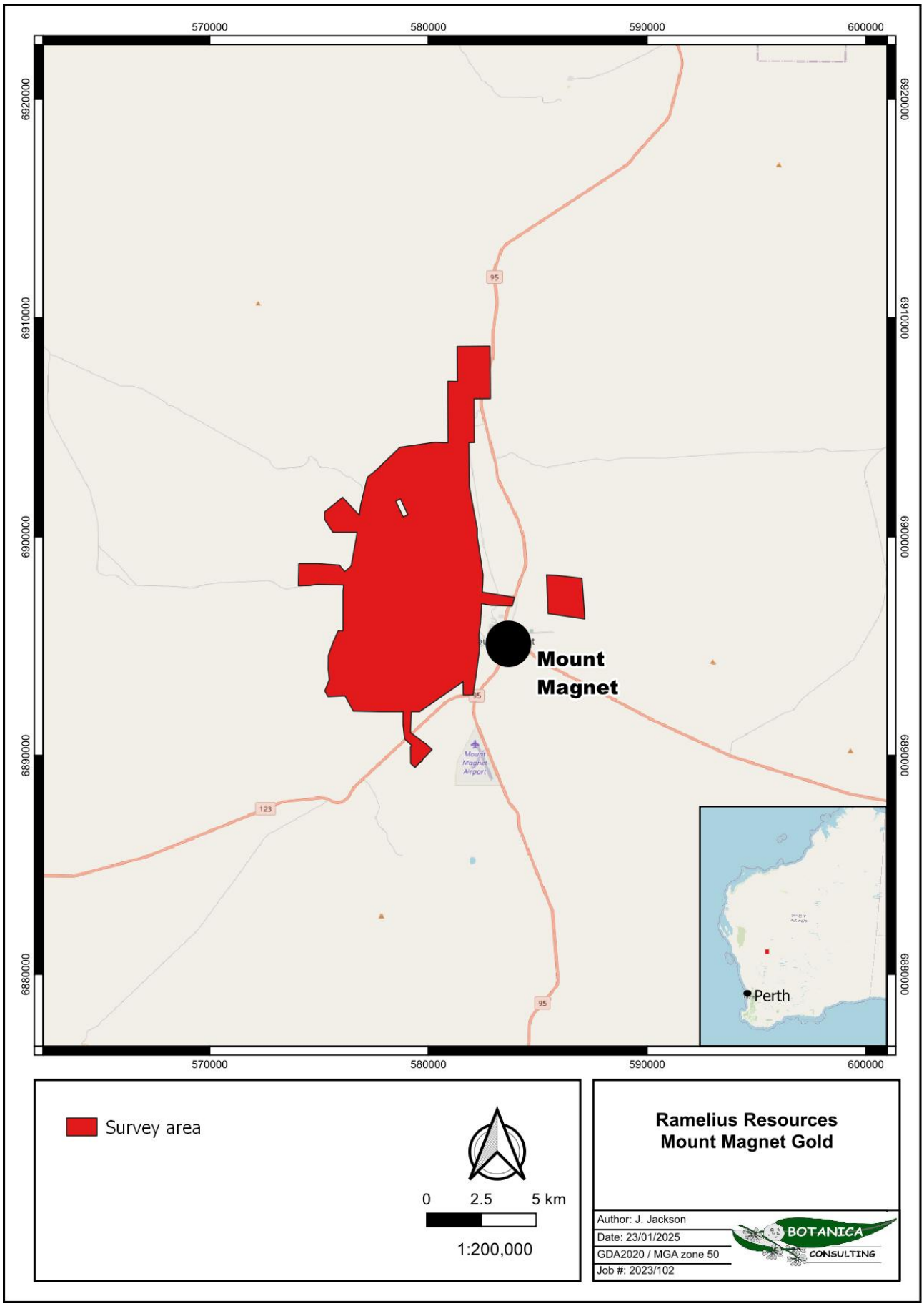


Figure 1-1: Regional map of the survey area

2 BIOPHYSICAL ENVIRONMENT

2.1 Regional Environment

The survey area lies within the Eremaean Province of Western Australia (WA). Based on the Interim Biogeographic Regionalisation of Australia (IBRA, Version 7) (DCCEEW, 2020) the survey area is located within the Murchison Bioregion of WA. This bioregion is further divided into subregions with the survey area located within the Eastern Murchison (MUR1) subregion of the Murchison Bioregion (Figure 2-1).

The landscape of the Murchison Bioregion comprises low hills, mesas of duricrust separated by flat colluvium and alluvial plains (Commonwealth Government, 2020. It is dominated by the Archaean (over 2500 million years ago) granite greenstone terrain of the Yilgarn Craton (Commonwealth Government, 2008). Alluvial soils and sands mantle the granitic and greenstone units of the Yilgarn Craton. These soils are shallow, sandy and infertile. Underlying the soils in low areas is a red-brown siliceous hard pan (Curry *et al.* 1994). The soils in the eastern half of the bioregion are typically red sands, calcareous red earth soil, duplex soil and clays. There are 41 vegetation associations (hummock grasslands, succulent steppe or low woodlands) that have at least 85 per cent of their total area in the bioregion. The bioregion is rich and diverse in both its flora and fauna, but most species are wide ranging and usually occur in adjoining regions (McKenzie, May and McKenna, 2002).

The Eastern Murchison subregion comprises the northern parts of the craton's Southern Cross and Eastern Goldfields Terrains and is characterised by internal drainage and extensive areas of elevated red desert sandplains with minimal dune development. Salt Lake systems are associated with the occluded paleodrainage system. Broad plains of red-brown soils and breakaway complexes as well as red sandplains are widespread. Vegetation is dominated by Mulga woodlands and is often rich in ephemerals, hummock grasslands, saltbush shrublands and Samphire shrublands (McKenzie, May and McKenna, 2002). The Eastern Murchison subregion comprises diverse mulga woodlands, which occur on low greenstone belts. The sand plains have red loamy earths and red deep sands which are found on the sandy banks.

2.2 Land Use

The dominant land uses of the Eastern Murchison subregion include grazing native pastures (85.47%), unallocated crown reserves (11.34%), conservation (1.4%) and mining (1.79%) (Cowan, 2001). The survey area is in the Shire of Mount Magnet.

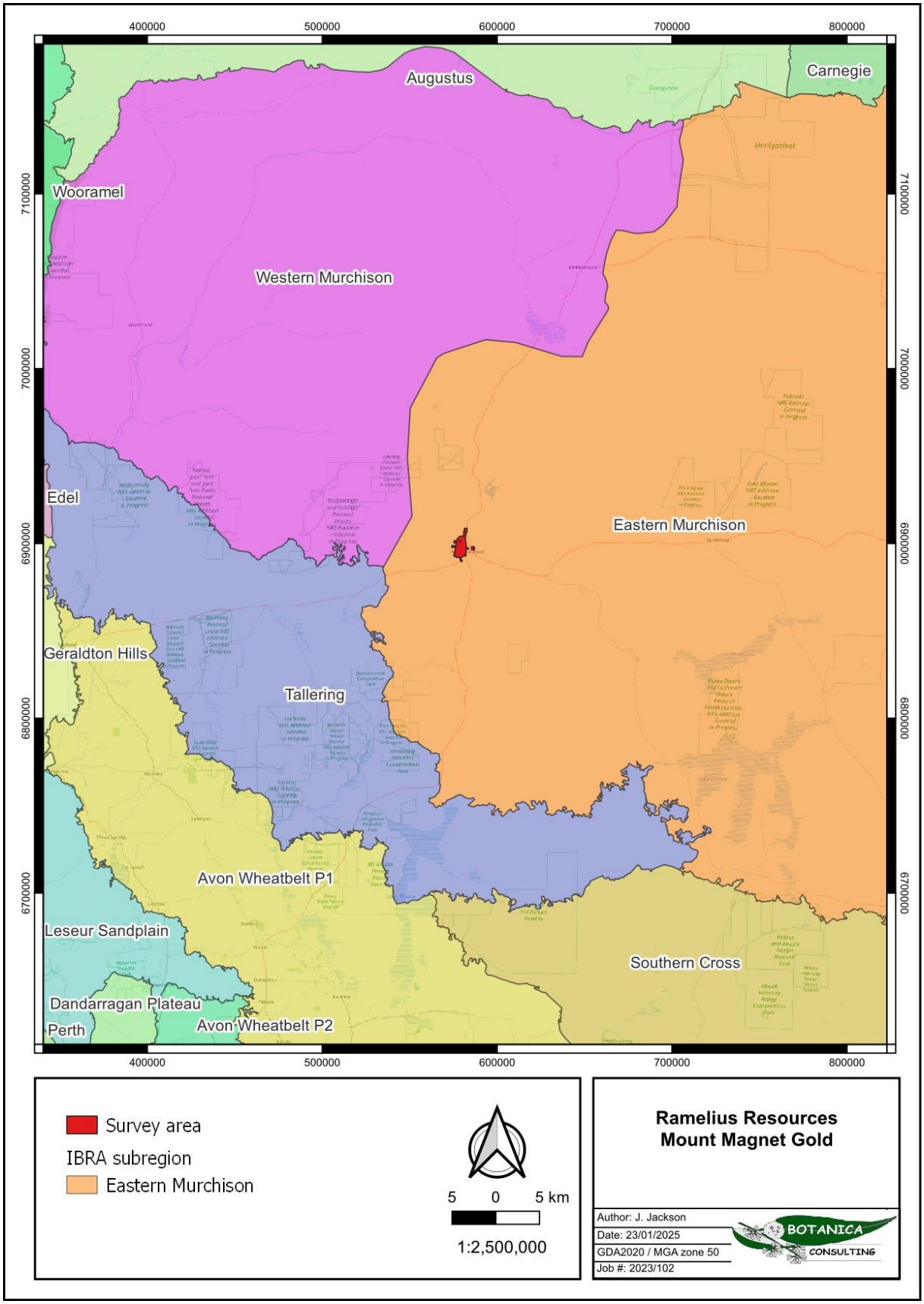


Figure 2-1: Map of IBRA Bioregion MUR1 in relation to the survey area

2.3 Soil Landscape Systems

The survey area lies within the Murchison Province, which consists of hardpan wash plains and sandplains (with some stony plains, hills, mesas and salt lakes) on the granitic rocks and greenstone of the Yilgarn Craton. Soils include red loamy earths, red sandy earths, red shallow loams, red deep sands and red-brown hardpan shallow loams (with some red shallow sands and red shallow sandy duplexes). Vegetation comprises of mulga shrublands with spinifex grasslands (and some bowgada shrublands, eucalypt woodlands and halophytic shrublands). This zone is located in the inland Mid-west and northern Goldfields between Three Springs, the Gascoyne River, Wiluna, Cosmo Newberry and Menzies. (Tille, 2006).

The Yalgoo Plains Zone is comprised of hardpan wash plains (with some sandplains, stony plains, mesas and granite outcrops) on granitic rocks (with some greenstone) of the Yilgarn Craton (Murchison Domain). Soils include red loamy earths and red shallow loams (often with hardpans) with red deep sands and red shallow sands and some red shallow sandy duplexes. Vegetation comprises mulga shrublands with bowgada shrublands (and some halophytic shrublands). This zone is located in the south-western Murchison from Paynes Find to Cue and Twin Peaks Station (Tille, 2006).

The Yalgoo Plains Zone is further divided into soil landscape systems (land systems), with the survey area located within seven soil landscape systems. These are described in Table 2-1 and shown in Figure 2-2.

Table 2-1: Soil landscape systems within the survey area

Soil Landscape Zone	Soil Landscape System	Description	Extent within Survey Area
Yalgoo (273)	Austin System	Saline stony plains with low rises and drainage foci supporting low halophytic shrublands with scattered mulga and snakewood.	1584.4 ha (19%)
	Gabanintha System	Greenstone ridges, hills and footslopes supporting sparse acacia and other mainly non-halophytic shrublands.	1462 ha (17.5%)
	Gransal System	Stony plains and low rises based on granite supporting mainly halophytic low shrublands.	38.4 ha (0.5%)
	Jundee System	Hardpan plains with variable gravelly mantles and minor sandy banks supporting weakly groved mulga shrublands.	2184ha (26.1%)
	Sherwood System	Breakaways, kaolinised footslopes and extensive gently sloping plains on granite supporting mulga shrublands and minor halophytic shrublands.	33.0 ha (0.4%)
	Violet System	Gently undulating gravelly plains on greenstone, laterite and hardpan, with low stony rises and minor saline plains; supporting groved mulga and bowgada shrublands and occasionally chenopod shrublands.	381.3 ha (4.5%)
	Wiluna System	Low greenstone hills with occasional lateritic breakaways and broad stony slopes, lower saline stony plains and broad drainage tracts; supporting sparse mulga and other acacia shrublands with patches of halophytic shrubs.	2677.2 ha (32%)
		Total	**8353.2 ha (100%)**

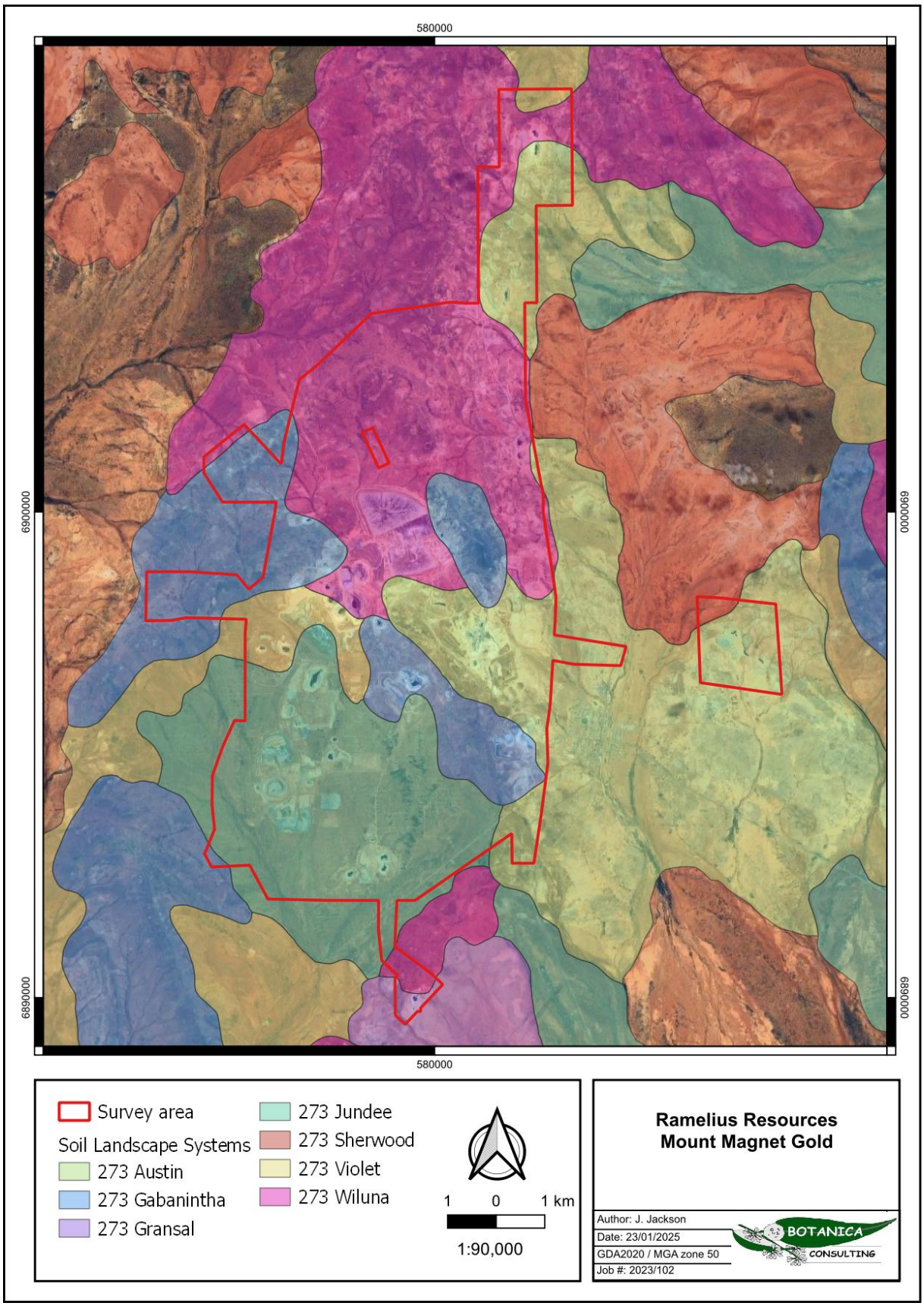


Figure 2-2: Map of soil landscape systems within the survey area

2.4 Regional Vegetation

Vegetation of the Murchison Bioregion in the Austin Botanical District is predominantly Mulga low woodlands on plains, often rich in ephemerals, which reduce to scrub on hills. It is also characterised by hummock grasslands, Saltbush shrublands and Samphire shrublands (Beard, 1990; Cowan, 2001).

2.4.1 Pre-European Vegetation

The Department of Primary Industries and Regional Development GIS file (DPIRD, 2021) indicates that the survey area is located within three pre-European Beard vegetation associations. The extent of these vegetation associations as specified in the *2018 Statewide Vegetation Statistics* (Government of Western Australia, 2019) is provided in Table 2-2 and shown in Figure 2-3.

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).

Table 2-2: Pre-European Vegetation Associations within the survey area

Pre-European Vegetation	Description	Pre-European Extent Remaining (%)	Current Extent Reserved for Conservation (%)	Extent within Survey Area
Upper Murchison 313	Saltbush and bluebush with scrub or open scrub; Mulga (*Acacia aneura*), other Acacia spp., Atriplex spp. and Maireana spp.	97.80	-	3566 ha (42.65%)
Barlee 202	Scrub, open scrub or sparse scrub; Acacia, Melaleuca (teatree) and other species.	99.96	-	5.2 ha (0.05%)
Barlee 312	Saltbush and bluebush; Atriplex spp. and Maireana spp. communities on alkaline soils.	94.75	-	4782 ha (57.3%)
			Total	**8353.2 ha (100%)**

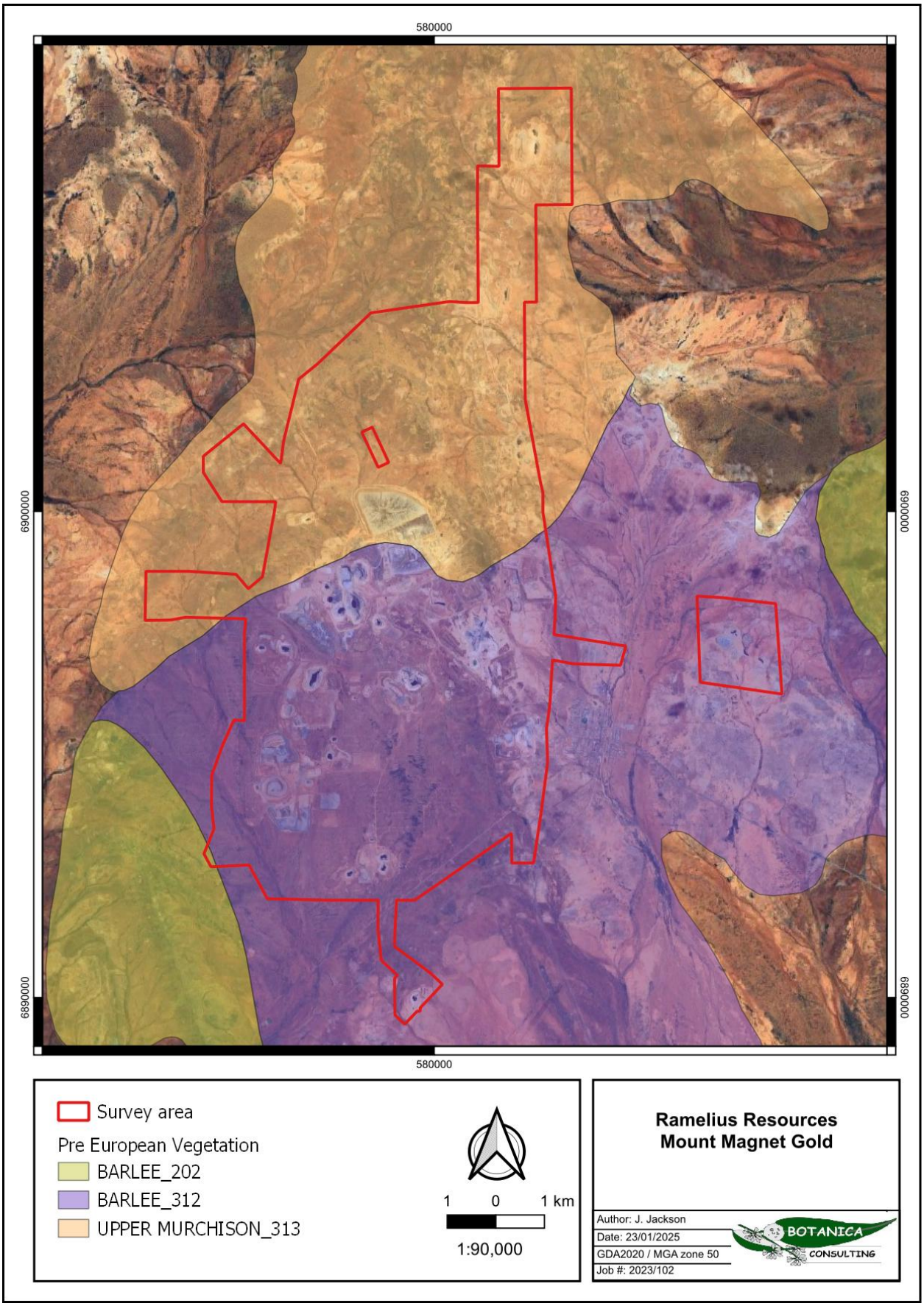
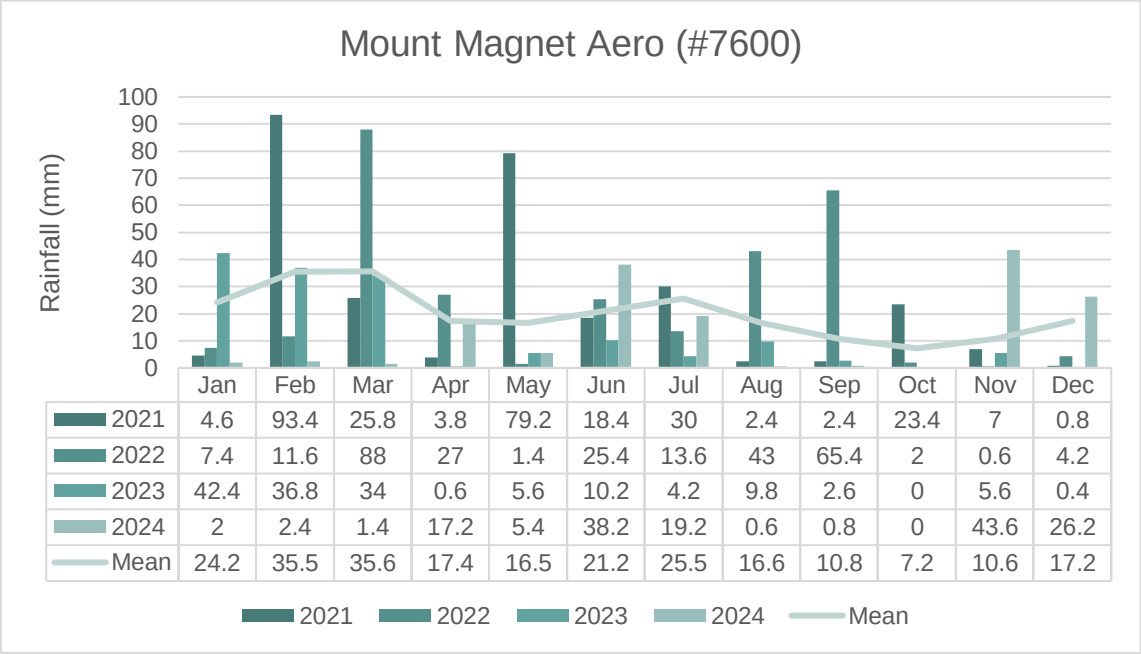


Figure 2-3: Pre-European vegetation systems within the survey area

2.5 Climate

The climate of the Eastern Murchison subregion is characterised as an arid climate with mainly winter rainfall and annual rainfall of approximately 200 millimetres (mm) (Beard, 1990; Cowan, 2001). Rainfall data for the Mount Magnet Aero weather station (#7600) located approximately 3 km south of the survey area is shown in Figure 2-4 (BoM, 2025a).

Mount Magnet Aero generally receives a mean annual rainfall of 244.7 mm. Rainfall for 12 months preceding the survey was below average, however, rainfall in April 2024 was close to the monthly average (Figure 2-4). Total rainfall for 2024 was 157 mm, this is well below the annual average.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	4.6	93.4	25.8	3.8	79.2	18.4	30	2.4	2.4	23.4	7	0.8
2022	7.4	11.6	88	27	1.4	25.4	13.6	43	65.4	2	0.6	4.2
2023	42.4	36.8	34	0.6	5.6	10.2	4.2	9.8	2.6	0	5.6	0.4
2024	2	2.4	1.4	17.2	5.4	38.2	19.2	0.6	0.8	0	43.6	26.2
Mean	24.2	35.5	35.6	17.4	16.5	21.2	25.5	16.6	10.8	7.2	10.6	17.2

Figure 2-4: Monthly rainfall of the Mount Magnet Aero Station #7600 (BoM, 2025a)

2.6 Conservation Values

No Threatened Ecological Communities listed under the Commonwealth EPBC Act, or the Western Australian BC Act are known to occur within the survey area or within 40 km of the survey area. There are four DBCA listed Priority Ecological Communities (PEC) known to occur within 40 km of the survey area, one of these, the Austin Land System has two occurrences within the survey area (Table 2-3, Figure 2-5).

Table 2-3: Priority Ecological Communities within a 40 km radius of the survey area

Community	Conservation Status	Description (DBCA, 2021)	Locality
Austin Land System	Priority 3	Saline stony plains with low rises and drainage foci supporting low halophytic shrublands with scattered mulga; occurs mainly adjacent to lakes Austin and Annean below greenstone hill systems.	There are four occurrences of this PEC within 40km of the survey area, two of these occur within the survey area.

Community	Conservation Status	Description (DBCA, 2021)	Locality
Lake Austin vegetation complexes (banded ironstone formation)	Priority 1	Not available	The buffer of this community is located approximately 6 km north of the survey area
Mount Magnet vegetation complexes (banded ironstone formation)	Priority 1	Not available	The buffer of this community is located immediately northeast of the survey area
Yoweragabbie Calcrete	Priority 1	Yoweragabbie calcrete groundwater assemblage type on Moore palaeodrainage on Yow	The buffer of this community is located approximately 9 km south of the survey area

There are no Ramsar wetlands or wetlands of national importance (ANCA Wetlands) within the survey area, or within 40 km of the survey area. There are no Environmentally Sensitive Areas (ESA) as listed under the EP Act within the survey area, or within 40 km of the survey area.

There are no gazetted conservation reserves within the survey area. The nearest gazetted conservation reserve is the Lakeside Conservation Park (R53840), located approximately 34 km north of the survey area.

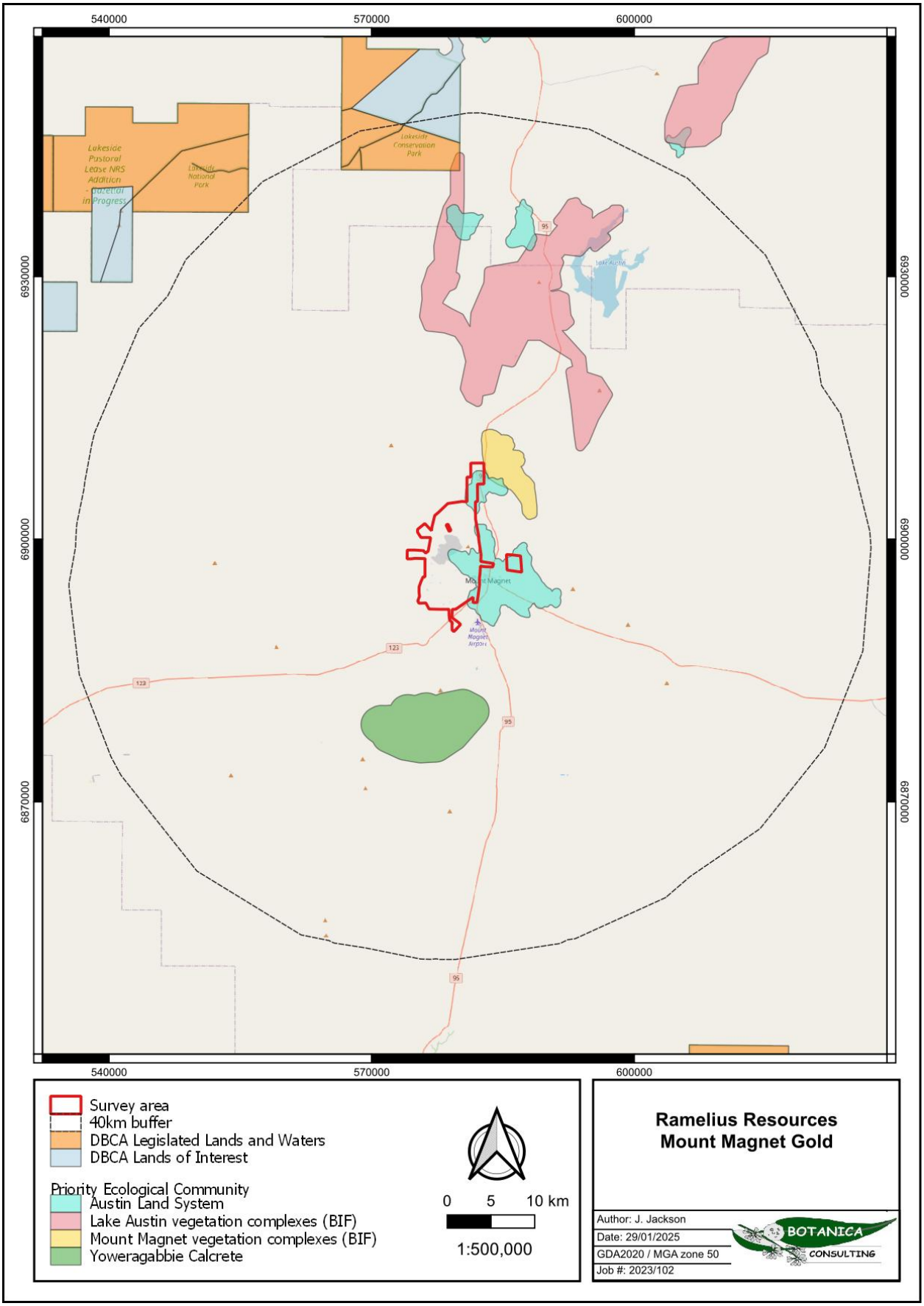


Figure 2-5: Conservation areas in relation to the survey area

2.7 Hydrology

According to the Geoscience Australia database (2015), there are no permanent/ perennial inland waters or drainage lines within the survey area. There are several minor ephemeral drainage lines occurring through the survey area (Figure 2-6).

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, 2024), there are no known or potential aquatic GDEs in the survey area. One potential terrestrial GDE intersects the survey area as described in Table 2-4 and shown in Figure 2-6.

Table 2-4: Potential terrestrial Groundwater Dependent Ecosystems within the survey area

Geomorphology	Potential	Vegetation Description
Sandplains and hardpan wash plains with outgoing drainage and salt lakes, broken by ridges of metamorphic rocks and granite.	Moderate	Ridges, hills and footslopes of various metamorphosed volcanic rocks (greenstones), supporting sparse acacia and other mainly non-halophytic shrublands.

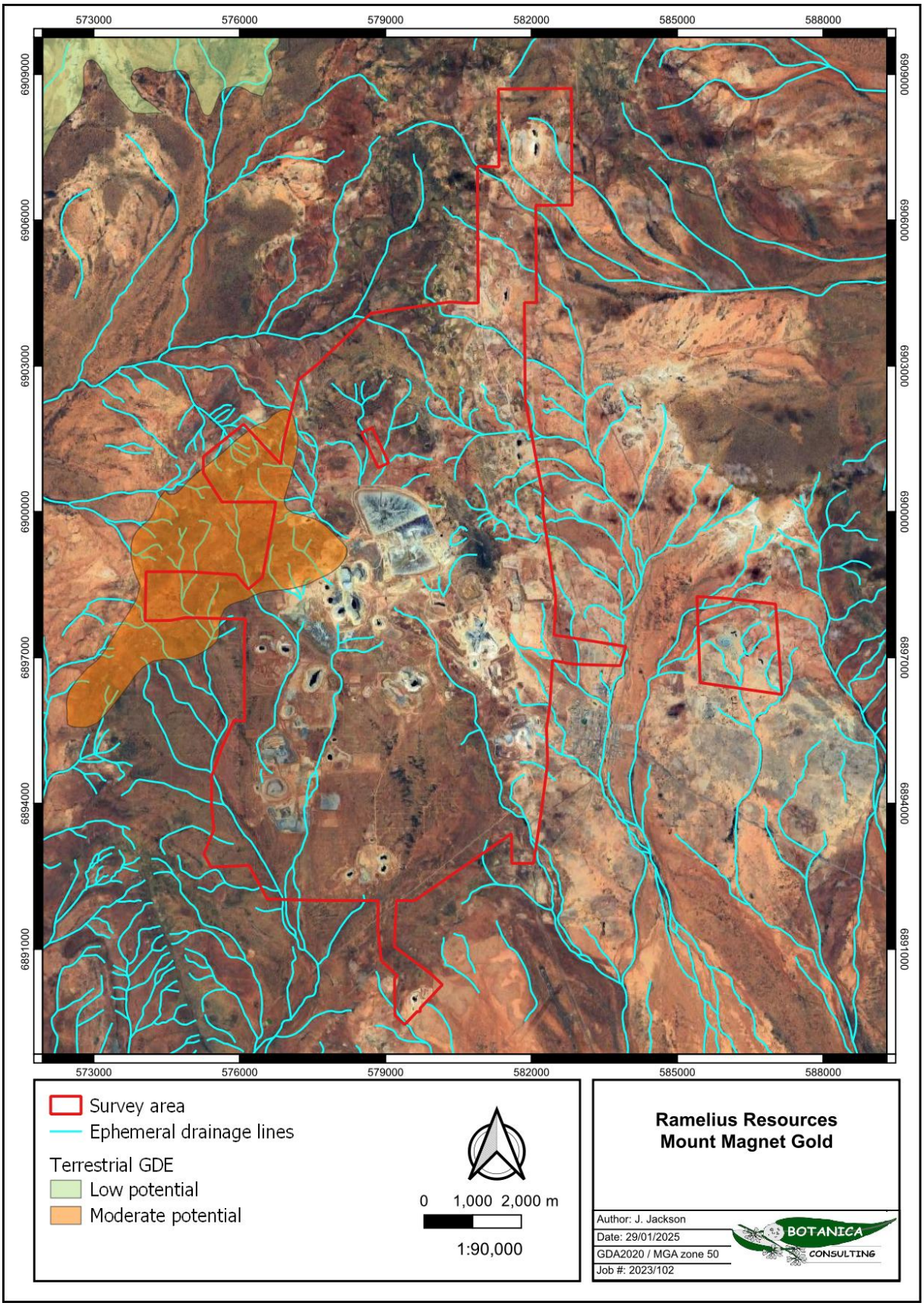


Figure 2-6: Regional hydrology of the survey area

3 SURVEY METHODOLOGY

3.1 Desktop Assessment

Ramelius acquired the Mt Magnet Gold Project in 2010 from Harmony Gold. There have been numerous flora and vegetation surveys over the general area, dating back to 1993. Ramelius provided these documents to Botanica for review prior to the survey.

Documents reviewed included:

- Botanica Consulting (2016). *Level 1 Flora and Vegetation Survey and Targeted Search for Flora and Fauna of Conservation Significance for the Checkers Plant Road*. Prepared for Mt Magnet Gold Pty Ltd. August 2016.
- Niche Environmental Services (2009). *Level 1 Flora and Vegetation Survey over the Galaxy Project Area*. Prepared for Harmony Gold Mt Magnet, September 2009.
- Niche Environmental Services (2010a). *Level 1 Flora and Vegetation Survey over the Brown Hill Project Area*. Prepared for Harmony Gold Mt Magnet, March 2010.
- Niche Environmental Services (2010b). *Level 1 Flora and Vegetation Survey over the Morning Star Project Area*. Prepared for Harmony Gold Mt Magnet, March 2010.
- Niche Environmental Services (2010c). *Level 1 Flora and Vegetation Survey over the Perseverance Project Area*. Prepared for Harmony Gold Mt Magnet, March 2010.
- Niche Environmental Services (2010d). *Level 1 Flora and Vegetation Survey over the Saturn Project Area*. Prepared for Harmony Gold Mt Magnet, March 2010.
- Outback Ecology Services (2007a). *Blackman's Banded Ironstone Formations: Vegetation and Flora Survey.* Prepared for Mt Magnet Gold Pty Ltd. October 2007.
- Outback Ecology Services (2007b). *Sirdar and Vicqueries Banded Ironstone Formations: Vegetation and Flora Survey.* Prepared for Harmony Gold Mt Magnet. August 2007.
- Outback Ecology Services (2008). *Cavanaghs Banded Ironstone Formations: Vegetation and Flora Survey.* Prepared for Mt Magnet Gold Pty Ltd. March 2008.
- Outback Ecology Services (2012). *Level 1 Flora and Vegetation Assessment and Terrestrial Fauna Desktop Study: Galaxy Mining Project.* Prepared for Mt Magnet Gold Pty Ltd. September 2012.
- Western Botanical (2006a). *Conservation Values of remnant flora and vegetation within current mining areas at Harmony Gold, Mt Magnet.* Prepared for Harmony Gold Mt Magnet, October 2006.
- Western Botanical (2006b). *Preliminary Assessment of Conservation Values of Flora and Vegetation on Banded Ironstone Formations surrounding Harmony Gold operations, Mt Magnet.* Prepared for Harmony Gold Mt Magnet, October 2006.

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

- Priority/ Threatened Flora Database Search (DBCA, 2023a);

- Priority/ Threatened Ecological Communities Database Search (DBCA, 2023b);
- Priority/ Threatened Fauna Database Search (DBCA, 2023c);
- Dandjoo Database (DBCA, 2024);
- Protected Matters search tool (DCCEEW, 2024).

The Protected Matters Search was conducted for the survey area with a 40 km buffer surrounding this. The Dandjoo search was conducted with a single point (578637E; 6899216N) with a 50 km buffer surrounding this. It should be noted that these lists are based on observations from a broader area than the assessment area (40-50 km 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 need to be taken into consideration when determining what actual species may be present within the specific area being investigated.

Significant flora species identified by the desktop review were assessed with regards to their population extent and distribution and preferred habitat to determine their likelihood of occurrence within the survey area. The assessment categorised flora species as follows:

- **Unlikely:** Suitable habitat is not expected to occur and/or the survey area is outside the known range of the species.
- **Possible:** Suitable habitat may be present, and the area is within the known range of the species. This option is also used when there is insufficient information to determine the preferred habitat of a species.
- **Previously Recorded:** A record for this species is located within the survey area. Field survey will ground-truth currently occurring individuals and populations.

Significant fauna species identified by the desktop review were assessed with regards to their distribution and preferred habitat to determine their likelihood of occurrence within the survey area. The assessment categorised fauna species as follows:

- **Would Not Occur:** There is no suitable habitat for the species in the survey area and/or there is no documented record of the species in the general area since records have been kept and/or the species is generally accepted as being locally/regionally extinct (supported by a lack of recent records).
- **Unlikely to Occur:** The survey area is outside of the currently documented distribution for the species in question, or no suitable habitat (type, quality and extent) was identified as being present during the field assessment. Individuals of some species may occur occasionally as vagrants/transients especially if suitable habitat is located nearby but the site itself would not support a population or part population of the species.
- **Possibly Occurs:** Survey area is within the known distribution of the species in question and habitat of at least marginal quality was identified as likely to be present during the field survey and literature review, supported in some cases by recent records being documented in literature from within or near the survey area. In some cases, while a species may be classified as possibly

being present at times, habitat may be marginal (e.g., poor quality, fragmented, limited in extent) and therefore the frequency of occurrence and/or population levels may be low.

- **Known to Occur:** The species in question has been positively identified as being present (for sedentary species) or as using the survey area as habitat for some other purpose (for non-sedentary/mobile species) during field surveys within or near the survey area. This information may have been obtained by direct observation of individuals or by way of secondary evidence (e.g., tracks, foraging debris, scats). In some cases, while a species may be classified as known to occur, habitat may be marginal (e.g., poor quality, fragmented, limited in extent) and therefore the frequency of occurrence and/or population levels may be low.

The conservation significance of flora and fauna taxa was assessed using data from the following sources:

- *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999*, administered by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW); *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 November 2024; flora list released November 2024).

The EPBC Act also requires the compilation of a list of migratory species that are recognised under international treaties including the:

- Japan Australia Migratory Bird Agreement 1981 (JAMBA)1;
- China Australia Migratory Bird Agreement 1998 (CAMBA);
- Republic of Korea-Australia Migratory Bird Agreement 2007 (ROKAMBA); and
- Bonn Convention 1979 (The Convention on the Conservation of Migratory Species of Wild Animals).

Most but not all migratory bird species listed in the annexes to these bilateral agreements are protected in Australia as Matters of National Environmental Significance (MNES) under the EPBC Act. Descriptions of conservation significant species and communities are provided in Appendix A.

3.2 Flora and Vegetation Field Assessment

Botanica conducted a detailed flora and vegetation survey on the 25 to 28 May 2024, with the survey undertaken by Jennifer Jackson (Senior Botanist, BSc (Honours) Environmental Management) and Amy Johnston (Field Technician). The survey area was traversed using a four-wheel drive vehicle and on foot. Three small areas were added to the original survey area after May 2024, and these

[1] Most but not all species listed under JAMBA are also specially protected under Specially Protected Species of the BC Act.

were surveyed on the 8th November 2024 by Jennifer Jackson and the 16th December 2024 by Jim Williams (Director, Principal Botanist).

3.2.1 Detailed Flora and Vegetation Survey

A total of 40 quadrats (50m x 50m) were installed during this survey. According to the recommended quadrat size specified in the Environmental Protection Authority (EPA) Guidelines, 20m x 20m quadrats are recommended for the Murchison Bioregion, but due to the sparse nature of the vegetation, larger quadrats were utilized. The quadrats were established by inserting survey marker pins into the Northwest corner, and measuring the length of the resultant boundaries to verify the quadrats were 50 m x 50 m (square quadrats). The objective was to have at least three quadrats per vegetation type to capture the floristic variations within the survey area. Quadrats were not established within regrowth/ modified vegetation.

Following their establishment and boundary verification, the Northwest corner of each quadrat was recorded by GPS (Appendix C) and three photographs of the quadrat were taken from the Northwest corner (Appendix G). All vascular plants within the quadrat were recorded (Appendix F). This included recording of dominant taxa from the upper, middle and lower stratum, and sampling of all unknown taxa. Unknown taxa were identified using Botanica's own reference herbarium and relevant taxonomic keys or by a taxonomic consultant. Data on level of disturbance, presence of coarse fragments on surface, topographical position, elevation, aspect, percentage litter, percentage bare ground, percentage surface rock (bedrock and surface deposits), soil types (colour, profile, field texture and surface type), and vegetation structure were collected from each quadrat (Appendix F). Methods of recording data from these quadrats largely follow those outlined in CSIRO's *Australian Soil and Land Survey Field Handbook* (McDonald *et al.* 1998) and in accordance with EPA Guidelines (2016). Presence/absence data of taxa from sample sites were used to compile the representative vegetation types.

3.2.2 Vegetation Mapping

Prior to the commencement of field work, aerial photography was inspected and obvious differences in the vegetation assemblages were identified. The different vegetation types 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 types.

At each sample point, the following information was recorded:

- GPS location;
- Photograph of vegetation;
- Dominant taxa for each stratum (including height and percentage cover of dominant taxa);
- All vascular taxa (including annual taxa);
- Landform classification;

- Vegetation condition rating;
- Collection and documentation of unknown plant specimens; and
- Collection of flora of conservation significance if encountered.

Vegetation types were classified in accordance with the NVIS Level V-Association classification.

3.3 Data Analysis Tools

Following field assessments, vegetation types and condition were mapped using the GIS program QGIS, and the hectare area/ percentage area of each vegetation type and condition within the survey area was calculated. Spatial maps illustrating the location of vegetation types, and any significant flora/ vegetation were generated using QGIS.

3.3.1 PATN Analysis

The PATN software package was used to assess the similarities/ dissimilarities between quadrats based on presence/absence of species. The 40 quadrats installed were included in the PATN analysis. A total of 99 taxa recorded within the quadrats were included in the analysis. Three subspecies were reconciled to one single species. 15 annuals and 13 singleton taxa were excluded from the analysis.

The analysis produced a quantitative estimate of the relationship between species composition of each quadrat. The classifications were based upon a Bray-Curtis association matrix using a flexible Unweighted Pair Group Arithmetic Mean (UPGMA) method (with a beta value of -0.1) which standardises the data enabling the analysis to be completed. Semi-strong hybrid (SSH) ordination of the quadrat is then undertaken to show spatial relationships between groups and to elucidate possible environmental correlates with the classification.

The analysis also produced a stress value which is a measure of the 'strength' of the analysis (i.e. how well the quadrats are grouped together into the appropriate floristic groups). The lower the stress value the greater the strength of the analysis with a value of less than 0.3 showing that the analysis appropriately grouped quadrats. A stress value greater than 0.3 suggests that the analysis was unable to group quadrats appropriately due to extraneous variables (i.e. other factors influencing differences in floristic groups other than species composition e.g. fire, clearing disturbance etc.).

3.3.2 EstimateS

EstimateS software was used to estimate species richness present using the Chao2 richness estimator. For any number of samples, the estimator uses the existing pattern of species accumulation to estimate the true number of species at a site. The estimators tend to under-estimate species number when sample size is small, hence the estimated number of true species can be seen to increase with sample size. This software was also used to compute Coleman rarefaction curves estimates which were used to calculate species accumulation curves.

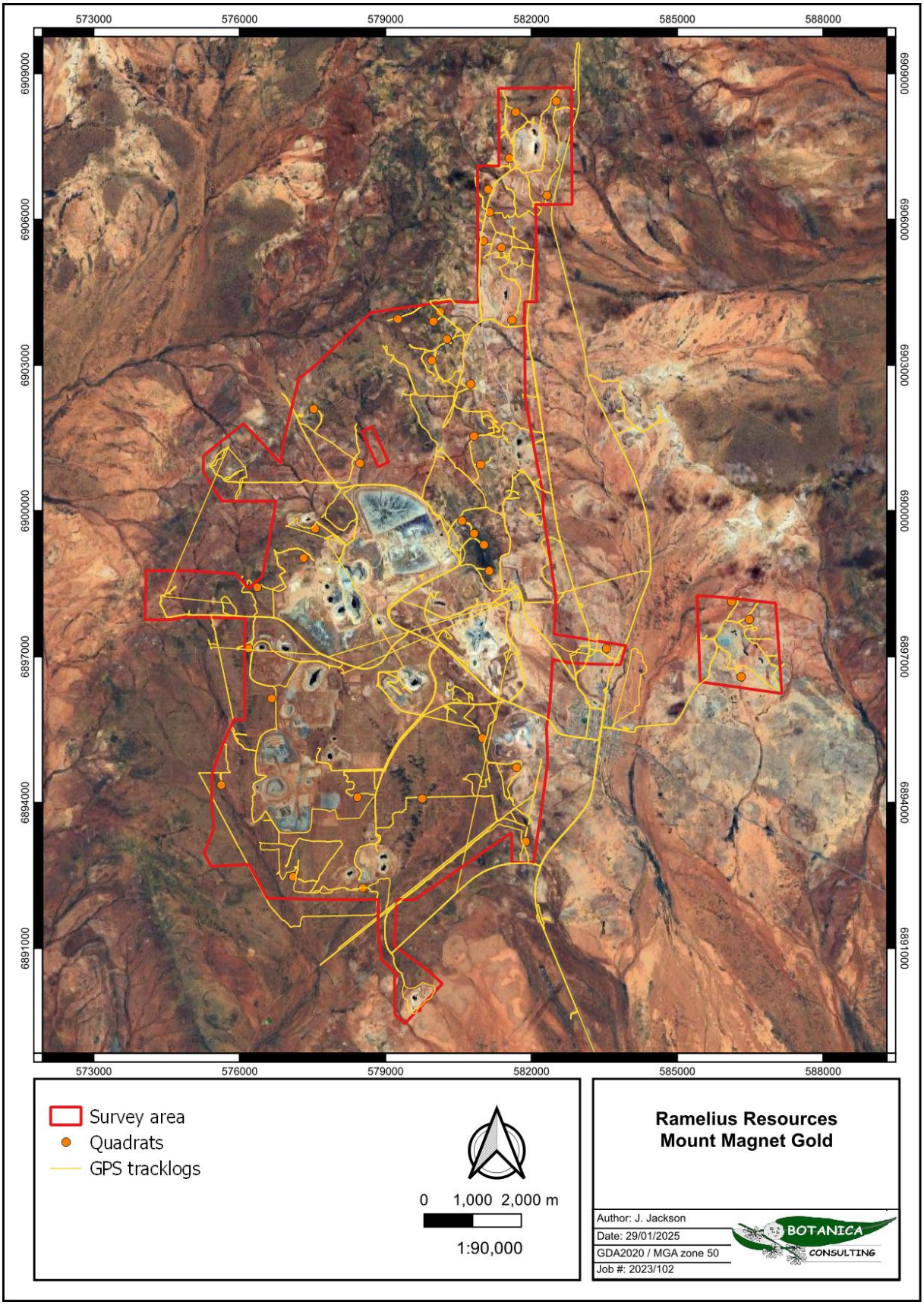


Figure 3-1: GPS track log of the survey effort and locations of quadrats

3.4 Scientific Licences

Table 3-1: Scientific Licenses of Botanica Staff coordinating the survey

Licensed Staff	Permit Number	Date of Expiry
Jennifer Jackson	FB62000309-2 (Licence to take flora for scientific purposes)	11/01/2027
Jim Williams	FB62000457 (Licence to take flora for scientific purposes)	04/08/2025

3.5 Survey Limitations and Constraints

It is important to note that flora surveys will entail limitations notwithstanding careful planning and design. Potential limitations are listed in Table 3-2.

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.

Some species are reported as potentially occurring based on there being suitable habitat (quality and extent) within the survey area or immediately adjacent. The habitat requirements and ecology of many of the species known to occur in the wider area are however often not well understood or documented. It can therefore be difficult to exclude species from the potential list based on a lack of a specific habitats or microhabitats within the survey area. As a consequence of this limitation, the potential species list produced is most likely an overestimation of those species that actually utilise the survey area for some purpose.

In recognition of survey limitations, a precautionary approach has been adopted for this assessment. Any flora species that would possibly occur within the survey area (or immediately adjacent), as identified through ecological databases, publications, discussions with local experts/residents and the habitat knowledge of the author, has been listed as having the potential to occur.

Table 3-2: Limitations and constraints associated with the flora and vegetation survey

Variable	Potential Impact on Survey	Details
Access problems	Not a constraint	The survey was conducted using a four-wheel drive vehicle and walking. There were no access problems.
Competency/ Experience	Not a constraint	The Botanica personnel that conducted the survey were regarded as suitably qualified and experienced. **Coordinating Staff**: Jim Williams (Principal Botanist) and Jennifer Jackson (Senior Botanist (BSc Environmental Management (Honours)) both have more than 20 years' experience doing flora and fauna surveys in WA. **Data Interpretation**: Jennifer Jackson, Jim Williams.

Variable	Potential Impact on Survey	Details
Timing of survey, weather & season	Not a constraint	Fieldwork was carried out in May within the EPA's recommended timing for flora surveys (i.e. 6-8 weeks post wet season, March to June), some taxa were in flower and some annual species were present. Based on the scale of the survey and the coordinating botanist's local knowledge of flora in the region the timing of the survey was considered appropriate.
Area disturbance	Not a constraint	The area has been largely disturbed from previous mining and exploration, cattle and goat grazing and other human impacts; however, vegetation was mostly intact and comprised of native vegetation.
Survey Effort/ Extent	Not a constraint	Survey intensity was appropriate for the size/significance of the area with a detailed flora survey completed to identify vegetation types and significant flora and vegetation.
Availability of contextual information at a regional and local scale	Not a constraint	Conservation significant flora database searches provided by the DBCA were used to identify any potential locations of Threatened/Priority flora species. BoM, DWER, DPIRD, DBCA and DCCEEW databases were reviewed to obtain appropriate regional desktop information on the biophysical environment of the local region. Botanica has conducted numerous surveys within the Murchison bioregion and was also able to obtain information about the area from previous research conducted within the area. Results of previous assessments in the local area were reviewed to provide context on the local environment.
Completeness	Not a constraint	In the opinion of Botanica, the survey area was covered sufficiently to identify vegetation assemblages. Fieldwork was undertaken within the EPA's recommended timing for flora surveys (i.e. 6-8 weeks post wet season, March to June, rainfall was close to average for April, the month preceding the survey. All taxa were able to be identified to species level, and some annual species were present. The vegetation associations for this study were based on visual descriptions of locations in the field. The distribution of these vegetation associations outside the study area is not known, however vegetation associations identified were categorised via comparison to vegetation distributions throughout WA given on NVIS (DotEE, 2017).

4 RESULTS

4.1 Desktop Assessment

4.1.1 Flora

The Dandjoo database search (DBCA, 2024) identified 579 vascular flora species as occurring within 40 km of the survey area. The full list of vascular flora identified by the desktop search is provided in Appendix H.

4.1.1.1 Introduced Flora

The desktop review identified 17 introduced flora (weed) species as known to occur within 40 km of the survey area. One of the species is listed as a Declared Pest on the Western Australian Organism List (WAOL) under the *Biosecurity and Agriculture Management* (BAM) *Act 2007* and is also listed as a Weed of National Significance (WoNS) (Table 4-1).

Table 4-1: Weeds known to occur within 40 km of the survey area

Taxon	Common Name	Declared	WoNS
Asphodelus fistulosus	Onion weed	N	N
Avena fatua	Wild oat	N	N
Campylopus introflexus	Heath star moss	N	N
Clitoria ternatea	Asian pigeonwings	N	N
Cuscuta epithymum	Dodder	N	N
Diplotaxis muralis	Annual wall-rocket	N	N
Hypochaeris glabra	Smooth cat's ear	N	N
Medicago minima	Burr medic	N	N
Medicago polymorpha	Burr medic	N	N
Opuntia elatior	Red-flower prickly pear	Y	Y
Rostraria pumila	Tiny bristle grass	N	N
Schismus barbatus	Common Mediterranean grass	N	N
Solanum nigrum	Black Berry Nightshade	N	N
Sonchus oleraceus	Common Sow-thistle	N	N
Spergularia bocconei	Boccone's sandspurry	N	N
Tribulus terrestris	Caltrop	N	N
Vulpia bromoides	Brome fescue	N	N

4.1.1.2 Significant Flora

Assessment of the DBCA's Threatened and Priority Flora database records (Ref: 30-0423FL) (DBCA, 2023a), EPBC Protected Matters (DCCEEW, 2024a), Dandjoo database (DBCA, 2024) and previous relevant literature identified that no Threatened Flora have previously been recorded within the survey area or within 40 km of the survey area. Four Priority Flora have previously been recorded in the survey area; another 21 Priority flora have previously been recorded within a 40 km radius of the survey area.

These taxa were assessed for distribution and known habitat to determine their likelihood of occurrence within the survey area as shown in Table 4-2. The locations of DBCA database records for Significant Flora (DBCA, 2023a) in relation to the survey area is shown in Figure 4-1.

Table 4-2: Significant flora potentially occurring within the survey area.

Taxon	DBCA Priority	Habitat Description (WA Herbarium, 1998-)	Likelihood of Occurance
Acacia burrowsiana	3	Red-brown loams with ironstone rubble on surface, calcrete soils, laterite, quartz. Flats adjacent to watercourses, crests of low rises, breakaways.	Previously recorded in the survey area
Acacia lapidosa	1	Rocky diorite country.	Previously recorded in the survey area
Acacia speckii	4	Rocky soils over granite, basalt or dolerite. Rocky hills or rises.	Possible
Acacia subsessilis	3	Red sand or stony gravel over ironstone. Rocky hills.	Possible
Alyxia tetanifolia	3	Sandy clay, loam, concretionary gravel. Drainage lines, near lakes.	Previously recorded in the survey area
Angianthus microcephalus	2	Sandy or clayey soils. Salt swamps & pans.	Possible
Angianthus uniflorus	1	Margin of calcrete rise near gypseous salt lake.	Possible
Baeckea sp. London Bridge (M.E. Trudgen 5393)	3	Gravel, sandstone. Rocky breakaways & hills.	Possible
Dicrastylis linearifolia	3	Red sand. Sandplain.	Unlikely, no sandplain in the survey area.
Dodonaea amplisemina	4	Red-brown sandy clay on basalt and gabbro and banded ironstone or on dolerite and quartzite. Rocky hills.	Possible
Drosera eremaea	3	Variety of habitats.	Possible
Eragrostis sp. Lake Carey (J. Paterson & J. Warden WB 40825)	1	Alkali flat.	Possible
Euryomyrtus recurva	3	Yellow/red sand, brown/yellow sandy clay. Gravel pits, catchment slopes.	Possible
Goodenia neogoodenia	4	Red loam or clay. Near water.	Possible
Grevillea inconspicua	4	Loam, gravel. Along drainage lines on rocky outcrops, creeklines.	Possible
Jacksonia lanicarpa	1	Red sand.	Unlikely, no sandplain in the survey area.
Millotia depauperata	1	Sandy loam. Granite outcrops.	Possible
Minuria tridens	1	Roadsides.	Possible
Petrophile pauciflora	3	Decaying and dissected granite breakaways.	Possible
Philotheca nutans	1	Sandy soils. Low plains, undulating rises, edges of salt lakes.	Unlikely, no salt lakes in the survey area.
Ptilotus luteolus	3	Gravelly slopes downslope from Banded Ironstone outcrops.	Unlikely, no salt lakes in the survey area.
Stenanthemum mediale	1	Red clayey sand.	Previously recorded in the survey area
Tecticornia fimbriata	3	Clay, loam. Margins of salt & gypsum lakes.	Unlikely, no salt lakes in the survey area.
Tribulus adelacanthus	3	Gravelly soils, downslope from Banded Ironstone outcrop.	Possible

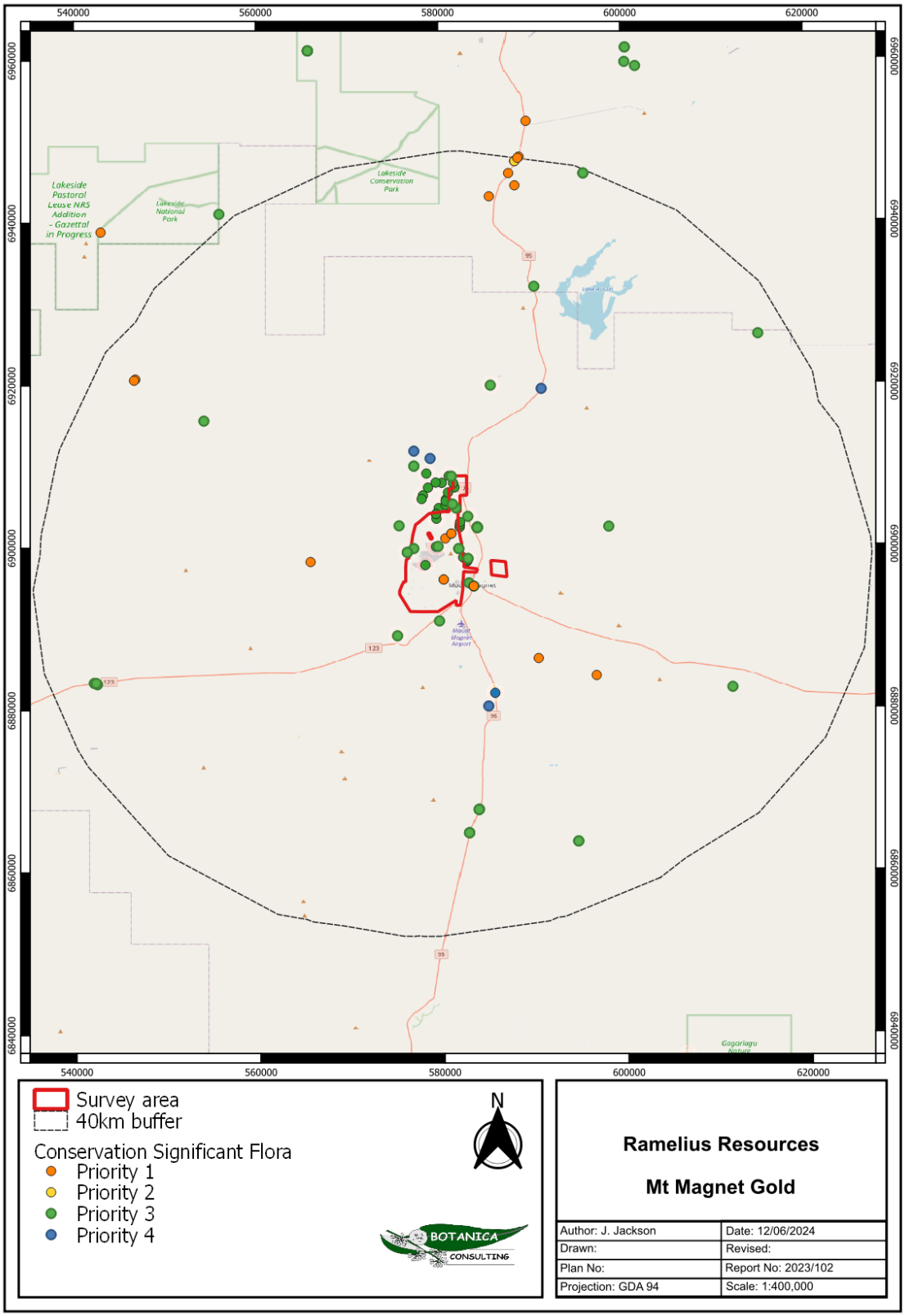


Figure 4-1: Significant flora records in relation to the survey area

4.1.2 Fauna

The Dandjoo database search (DBCA, 2024) identified a total of 117 terrestrial vertebrate fauna taxa having been previously recorded within 40 km of the survey area, consisting of 55 bird, eight mammal, 46 reptile and seven amphibian taxa. The full list of vertebrate fauna identified by the desktop search is contained in APPENDIX H.

4.1.2.1 Conservation Significant Fauna

The desktop review identified 18 terrestrial vertebrate fauna species of conservation significance as previously being recorded within 40 km of the survey area (DBCA, 2023c) and/or the species or species habitat that may occur within 40 km of the survey area (DCCEEW, 2024). Of those, nine are Threatened species, one is a Priority 4 species, one is a migratory species, one is an otherwise specially protected species and there are eight listed migratory wetland birds. Habitat and distribution data was used to determine the likelihood of occurrence within the survey area (Table 4-3).

Table 4-3: Potentially occurring significant fauna

Species	Conservation Status			Habitat Description	Assessment	Likelihood
	EPBC Act	BC Act	DBCA Priority			
Southern White Face *Aphelocephala leucopsis*	VU	-	-	Occur across most of mainland Australia south of the tropics, Southern whitefaces live in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both (DCCEEW, 2024).	PMST records state that the species or species habitat may be in the area. Previously recorded in the survey area (1965 record).	Possible- area may form part of larger home range.
Sharp-tailed Sandpiper *Calidris acuminata*	VU	MI		Intertidal mudflats, also freshwater swamps and saltwater lakes (ALA, 2024).	Habitat not present in the survey area.	Unlikely to occur.
Curlew Sandpiper *Calidris ferruginea*	CR	CR		Intertidal mudflats, also freshwater swamps and saltwater lakes (ALA, 2024).	Habitat not present in the survey area.	Unlikely to occur.
Gilled slender blue-tongue *Cyclodomorphus branchialis*		VU		Inhabits semi-arid shrublands from the Irwin River north to the Murchison River and inland to Yalgoo (OES, 2012).	Previously recorded in the survey area (2005).	Possibly still present in undisturbed parts of the survey area.
Western Spiny-tailed Skink *Egernia stokesii badia*	EN	VU		The Western Spiny-tailed Skink is known to occur in a broad semi-arid area in south-west WA, between Shark Bay and Minnivale and east to Cue. Most records of the brown form Western Spiny-tailed Skink are in York Gum (*Eucalyptus loxophleba*) woodland (Smith pers. comm. cited in Cogger et al. 1993; How et al. undated) with some records in Gimlet (*E. salubris*) and Salmon Gum (*E. salmonophloia*) woodland (DCCEEW, 2024b).	PMST records state that the species or species habitat may be in the area. Nearest known records are >40km from the survey area (DBCA, 2023c)	Unlikely to occur.
Peregrine Falcon *Falco peregrinus*		OS		Open grasslands, wooded areas and tall structures in urban areas (ALA, 2024).	Previously recorded in the survey area (1993 record).	Possible
Malleefowl *Leipoa ocellata*	VU	VU	-	Scrublands and woodlands dominated by mallee and wattle species (DCCEEW, 2024b).	Three records within 40km of the survey area, previous sighting of a bird was in 2001.	Possible
Grey Wagtail *Motacilla cinerea*	MI	IA	-	Running water in disused quarries, sandy, rocky streams in escarpments and rainforest, sewerage ponds, ploughed fields and airfields (Morecombe 2004).	No sightings from inland WA. Unlikely that suitable habitat would be present in the survey area.	Unlikely to Occur
Night Parrot *Pezoporus occidentalis*	EN	CR	-	Broad habitat requirements include areas of old-growth spinifex (*Triodia*) for roosting and nesting, together with foraging habitats that are likely to include various native	PMST records state that the species or species habitat may be in the area.	Unlikely to Occur

Species	Conservation Status			Habitat Description	Assessment	Likelihood
	EPBC Act	BC Act	DBCA Priority			
				grasses and herbs, that may or may not contain shrubs or low trees. (DPaW, 2017).	Considered to be locally extinct. Suitable habitat not present.	
Australian Painted Snipe *Rostratula australis*	EN	EN		Shallow, freshwater wetlands with a thick cover of low vegetation, disappearing when conditions become unsuitable (ALA, 2024).	Habitat not present in the survey area.	Unlikely to occur.
Hooded plover *Thinornis cucullatus*			P4	Ocean sandy beaches and coastal lake of Southern mainland Australia and Tasmania (ALA, 2024).	Habitat not present in the survey area.	Unlikely to occur.
Common Greenshank *Tringa nebularia*	EN	MI		Inland wetlands and sheltered coastal areas, including mudflats, saltmarshes, river estuaries, deltas and lagoons (ALA, 2024).	Habitat not present in the survey area.	Unlikely to occur.
Migratory Shorebirds (various species)	MI	MI	-	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 (DCCEEW, 2024b).	Habitat not present in the survey area.	Unlikely to Occur within the survey area

4.2 Field Assessment

4.2.1 Flora

The field survey identified 100 vascular flora taxa within the survey area from 28 families and 50 Genera as occurring in the survey area. Dominant genera include *Acacia* (18 species), *Eremophila* (11 species), *Ptilotus* (six species) and *Senna* (five species). Fifteen annual species were recorded. The full field species inventory is listed in Appendix B.

4.2.1.1 Introduced Flora

One introduced flora species, Buffel grass (*Cenchrus ciliaris*), was recorded within the quadrats (Q40). Four other weed species were observed in the survey area, they were observed in disturbed areas and adjacent to tracks and their locations were not marked. None of these species are listed as a Declared Pest on the Western Australian Organism List (WAOL) under the Biosecurity and Agriculture Management (BAM) Act 2007 or as a Weed of National Significance. These were:

- *Cenchrus setaceus* (Fountain grass).
- *Citrullus amarus (*Fodder melon),
- *Nicotiana glauca* (Tree tobacco), and
- *Schinus molle (*Pepper tree).

Athel pine (*Tamarix aphylla*) which is a Weed of National Significance was observed at two locations in the survey area (Figure 4-2).

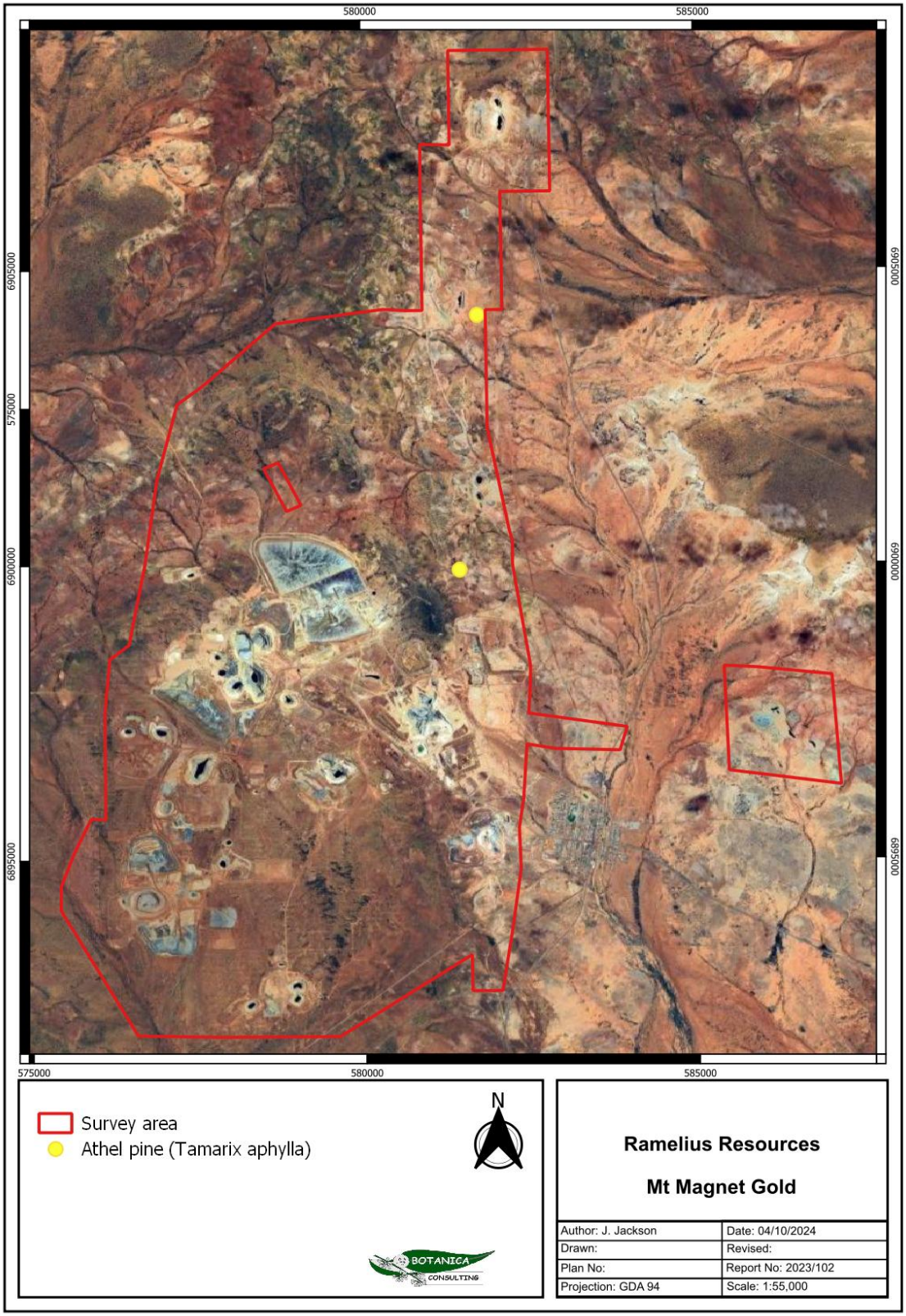


Figure 4-2: Location of Athel Pine (*Tamarix aphylla*) in the survey area

4.2.1.2 Significant Flora

According to the EPA *Environmental Factor Guideline for Flora and Vegetation* (EPA, 2016b) 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 are previously known to occur or were identified within the survey area. Four species of Priority Flora taxa were identified in the survey area. The two other Priority flora that have previously been recorded in the survey area are also discussed here.

***Acacia burrowsiana* (Priority 3)**

There are several records of this P3 flora having previously been recorded in the survey area. These records were searched for during this survey. *Acacia burrowsiana* was observed at four locations in the survey area, with several plants observed at each location (Figure 4-3).

***Acacia lapidosa* (Priority 1)**

There were two previous records of this P1 flora in the survey area. These records were searched for during this survey, including a revisit to the site in August 2024 when Acacia would be at their peak flowering, and this taxon was not found.

***Alyxia tetanifolia* (Priority 3)**

There are several records of this P3 flora having previously been recorded in the survey area. These records were searched for during this survey, however *Alyxia tetanifolia* was observed in only one location (Figure 4-3). A population of up to 100 plants was observed on a small rocky hill.

***Drosera eremaea* (P3)**

There was one previous record of this P3 flora adjacent to the survey area. This taxon was found in the south of the survey area in a drainage line (Figure 4-3).

***Ptilotus beardii* (Priority 3)**

This had not been recorded in the survey area previously and was identified during the visit in November 2024. A population of approximately 100 plants was observed on a small rocky rise (Figure 4-3). The nearest populations are more than 50 km to the north (WA Herbarium, 1998-).

***Stenanthemum mediale* (Priority 1)**

There was one previous record of this P1 flora in the survey area. This record was searched for during this survey, and this taxon was not found.

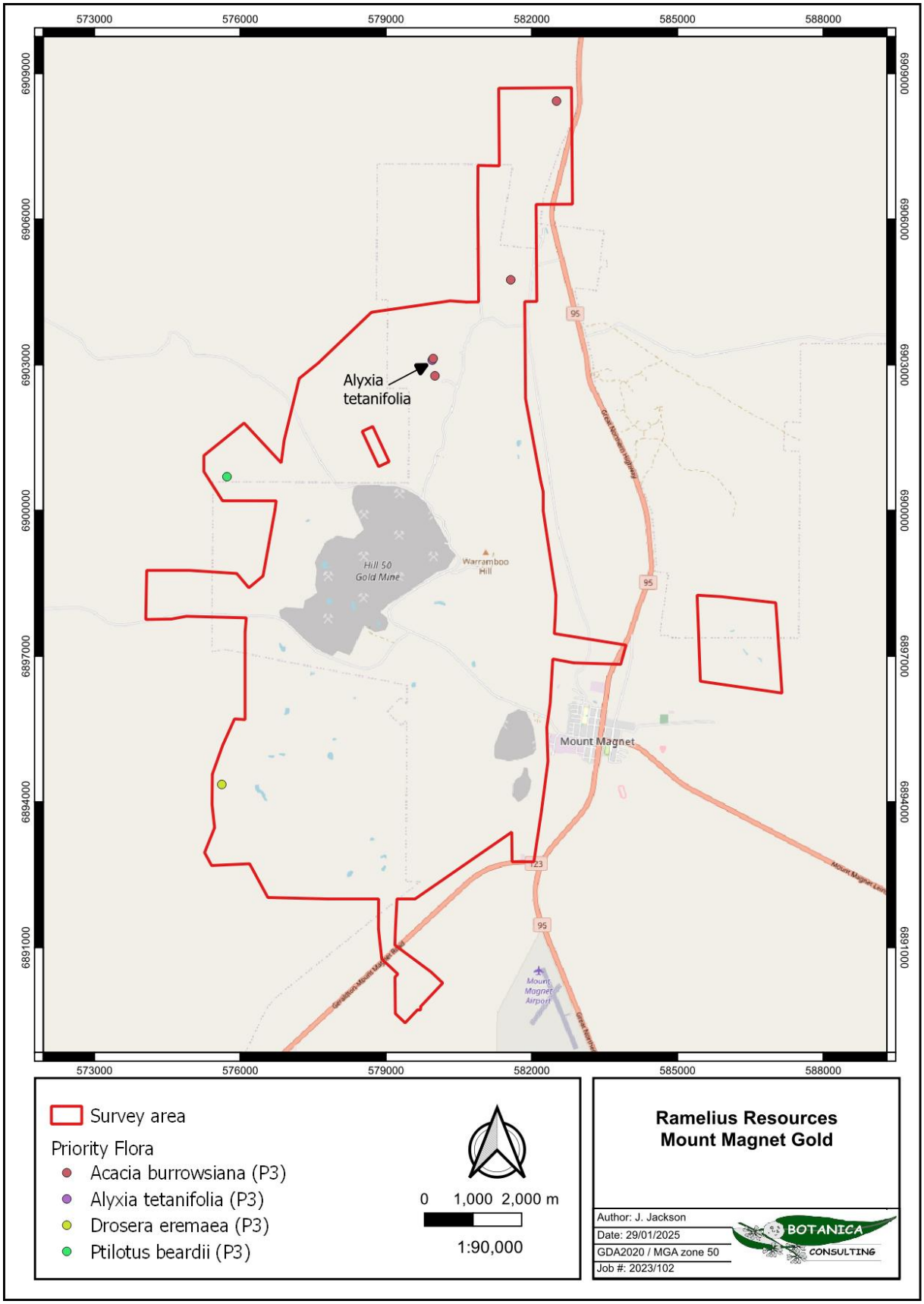


Figure 4-3: Priority flora observed in the survey area

4.2.2 Vegetation

4.2.2.1 Vegetation Communities

A total of eleven broad-scale vegetation communities were identified within the survey area. These vegetation types were identified within five landform types and comprised of three major vegetation groups. Vegetation community descriptions and extent are listed below in Table 4-4 and illustrated spatially in Figure 4-4. Vegetation community descriptions and extents were determined from field survey results, aerial imagery interpretation and extrapolation of the communities.

Table 4-4: Summary of vegetation types within the survey area

Landform	NVIS Vegetation Group	Veg Code	Vegetation Type	Area (ha)	Area (%)	Image
Drainage depression	Acacia Woodlands (MVG 6)	DD-AOW1	Low open woodland of *Acacia aptaneura* over low open shrubland of *Eremophila exilifolia* and *Acacia tetragonophylla* over low sparse chenopod shrubland of *Maireana triptera* and *Maireana pyramidata* in drainage depression. Quadrats 1, 3, 9, 26	304	3.5	
	Acacia Woodlands (MVG 6)	DD-AFW1	Low open forest of *Acacia incurvaneura* over low open shrubland of *Acacia tetragonophylla* and *Eremophila punicea* over low sparse chenopod shrubland of *Atriplex bunburyana* and *Maireana pyramidata* in drainage depression. Quadrats 5, 14, 20, 24	449.8	5.2	

Landform	NVIS Vegetation Group	Veg Code	Vegetation Type	Area (ha)	Area (%)	Image
Drainage depression	Eucalypt Woodlands (MVG 5)	DD-EW1	Mid open forest of *Eucalyptus striaticalyx* over mid open shrubland of *Melaleuca leiocarpa, Eremophila pantonii* and *Exocarpos aphyllus* over low sparse chenopod shrubland of *Tecticornia disarticulata, Enchylaena tomentosa* and *Maireana triptera* in drainage depression. Quadrat 16	5.8	0.1	
Clay Loam Plain	Acacia Woodlands (MVG 6)	CLP-AOW1	Low open woodland of *Acacia aptaneura* and/or *Acacia incurvaneura* over mid open shrubland of *Acacia acuminata* over sparse low shrubland of *Ptilotus obovatus* and *Eremophila compacta* on clay loam plain. Quadrats 8, 28, 30, 34, 35, 40	1648.2	19.0	

Landform	NVIS Vegetation Group	Veg Code	Vegetation Type	Area (ha)	Area (%)	Image
Clay Loam Plain	Acacia Woodlands (MVG 6)	CLP-AFW1	Low open forest of *Acacia incurvaneura* over mid open shrubland of *Acacia ramulosa* var *ramulosa* over sparse low shrubland of *Eremophila punicea* and *E. compacta* on clay loam plain. Quadrats 27, 29, 32, 33	1120.7	12.9	
	Chenopod shrublands (MVG 22)	CLP-CS1	Low open shrubland of *Acacia tetragonophylla* over low chenopod shrubland of *Maireana pyramidata, Enchylaena tomentosa* and *Maireana triptera* on clay loam plain. Quadrats 3, 11	335	3.9	

Landform	NVIS Vegetation Group	Veg Code	Vegetation Type	Area (ha)	Area (%)	Image
Rocky Slope	Acacia Woodlands (MVG 6)	RS-AFW1	Low open forest of *Acacia aptaneura* and/or *Acacia incurvaneura* over mid open shrubland of *Acacia grasbyi* over low sparse chenopod shrubland of *Maireana triptera* on rocky slope. Quadrats 17, 18, 19, 23, 25	553.6	6.4	
	Acacia Woodlands (MVG 6)	RS-AOW1	Low open woodland of *Acacia ramulosa* var. *ramulosa* over mid sparse shrubland of *Eremophila exilifolia* over low sparse chenopod shrubland of *Maireana triptera* on rocky slope. Quadrat 2	99.4	1.1	

Landform	NVIS Vegetation Group	Veg Code	Vegetation Type	Area (ha)	Area (%)	Image
Rocky hill	Acacia Woodlands (MVG 6)	RH-AFW1	Low open forest of *Acacia aptaneura* and/or *Acacia incurvaneura* over mid shrubland of *Thryptomene decussata* over low sparse shrubland of *Eremophila latrobei* on rocky hill. Quadrats 13, 15, 22, 37, 38, 39	177.7	2.0	
	Acacia Woodlands (MVG 6)	RH-AOW1	Low open woodland of *Acacia aptaneura* over mid sparse shrubland of *Thryptomene decussata* over low sparse shrubland of *Eremophila clarkei* on rocky hill. Quadrats 21, 31	237.6	2.7	

Landform	NVIS Vegetation Group	Veg Code	Vegetation Type	Area (ha)	Area (%)	Image
Rocky plain	Acacia Woodlands (MVG 6)	RP-AW1	Low woodland of *Acacia aptaneura* and/or *Acacia incurvaneura* over mid open shrubland of *Acacia grasbyi* over sparse low chenopod shrubland of *Maireana triptera* on clay loam plain. Quadrats 7,10, 12, 20	574	6.6	
Cleared areas		Cleared	Cleared areas with no vegetation	2853	33	
			Total	**8651**	**100**	

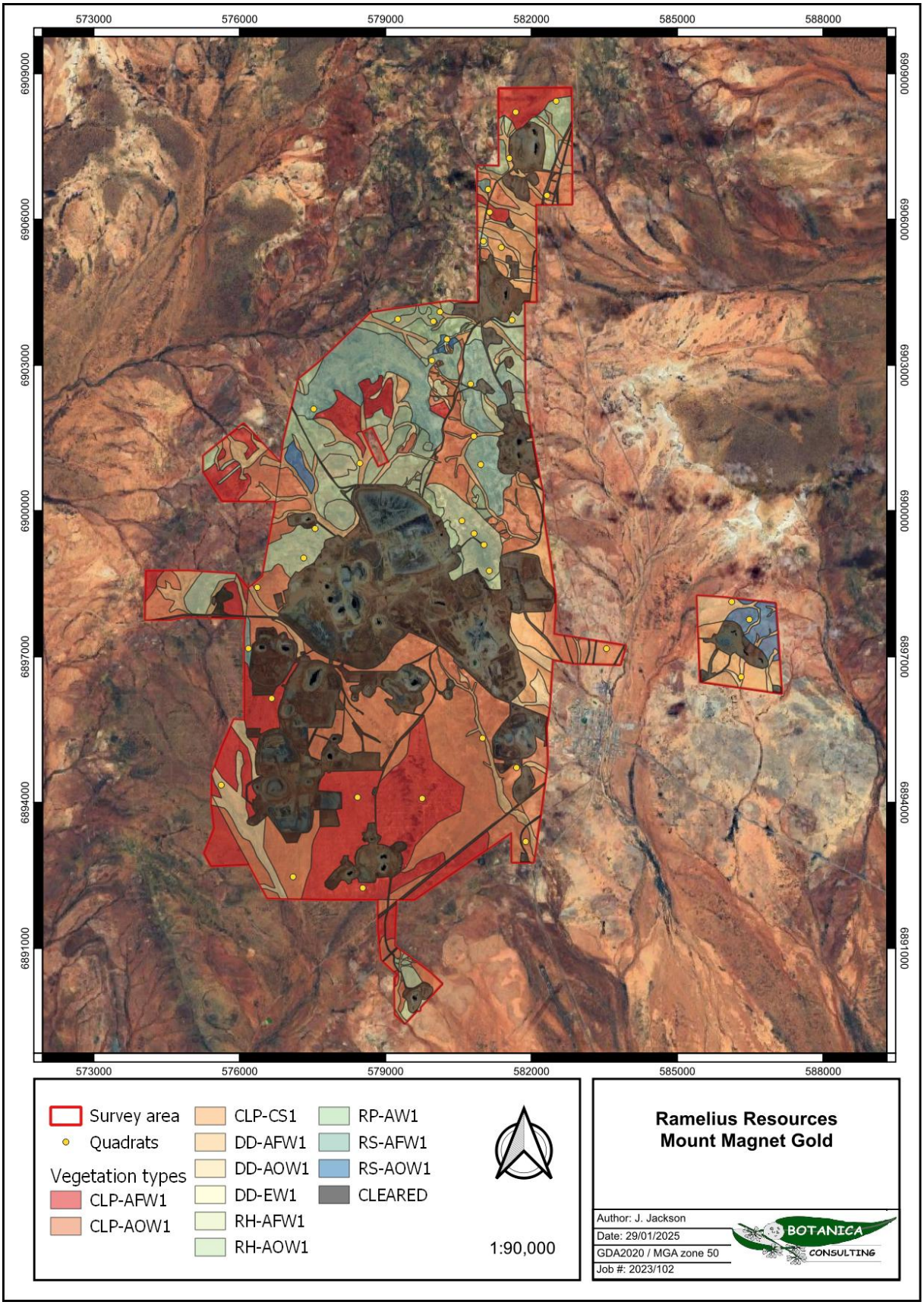


Figure 4-4: Vegetation types within the survey area

4.2.3 Floristic Composition

Statistical analysis was conducted on quadrat data obtained from the survey to determine the similarities or differences in floristic composition between vegetation associations. The dendrogram, two-way table and ordination graph generated from the PATN statistical analysis is provided in Appendix E. A list of the 40 quadrats and their respective vegetation associations are provided in Table 4-5. The PATN analysis produced a stress value of 0.1971.

Table 4-5: Vegetation communities with corresponding quadrats

Vegetation Type	Vegetation Code	Quadrats
Low open woodland of *Acacia aptaneura* over low open shrubland of *Eremophila exilifolia* and *Acacia tetragonophylla* over low sparse chenopod shrubland of *Maireana triptera* and *Maireana pyramidata* in drainage depression.	DD-AOW1	1, 3, 9, 26
Low open forest of *Acacia incurvaneura* over low open shrubland of *Acacia tetragonophylla* and *Eremophila punicea* over low sparse chenopod shrubland of *Atriplex bunburyana* and *Maireana pyramidata* in drainage depression.	DD-AFW1	5, 14, 20, 24
Mid open forest of *Eucalyptus striaticalyx* over mid open shrubland of *Melaleuca leiocarpa, Eremophila pantonii* and *Exocarpos aphyllus* over low sparse chenopod shrubland of *Tecticornia disarticulata, Enchylaena tomentosa* and *Maireana triptera* in drainage depression.	DD-EW1	16
Low open woodland of *Acacia aptaneura* and/or *Acacia incurvaneura* over mid open shrubland of *Acacia acuminata* over sparse low shrubland of *Ptilotus obovatus* and *Eremophila compacta* on clay loam plain.	CLP-AOW1	8, 28, 30, 34, 35, 40
Low open forest of *Acacia incurvaneura* over mid open shrubland of *Acacia ramulosa* var *ramulosa* over sparse low shrubland of *Eremophila punicea* and *E. compacta* on clay loam plain.	CLP-AFW1	4, 27, 29, 32, 33
Low open shrubland of *Acacia tetragonophylla* over low chenopod shrubland of *Maireana pyramidata, Enchylaena tomentosa* and *Maireana triptera* on clay loam plain.	CLP-CS1	3, 11
Low open forest of *Acacia aptaneura* and/or *Acacia incurvaneura* over mid open shrubland of *Acacia grasbyi* over low sparse chenopod shrubland of *Maireana triptera* on rocky slope.	RS-AFW1	17, 18, 19, 23, 25
Low open woodland of *Acacia ramulosa* var. *ramulosa* over mid sparse shrubland of *Eremophila exilifolia* over low sparse chenopod shrubland of *Maireana triptera* on rocky slope.	RS-AOW1	2
Low open forest of *Acacia aptaneura* and/or *Acacia incurvaneura* over mid shrubland of *Thryptomene decussata* over low sparse shrubland of *Eremophila latrobei* on rocky hill.	RH-AFW1	13, 15, 22, 37, 38, 39
Low open woodland of *Acacia aptaneura* over mid sparse shrubland of *Thryptomene decussata* over low sparse shrubland of *Eremophila clarkei* on rocky hill.	RH-AOW1	21, 31
Low woodland of *Acacia aptaneura* and/or *Acacia incurvaneura* over mid open shrubland of *Acacia grasbyi* over sparse low chenopod shrubland of *Maireana triptera* on clay loam plain.	RP-AW1	7,10, 12, 20

A total of six species groups were identified in the analysis (species group A to F) as shown in the two-way table (Appendix E). Field based observations of vegetation type delineations were mostly supported by the results of the PATN analysis.

The first floristic group was characterised by species group D (see two-way table provided in Appendix E), with an average species richness of 10 taxa per quadrat (ranged from six to 14 taxa per quadrat).

The second floristic group was characterised by species group D, with an average species richness of eight taxa per quadrat (ranged from six to ten taxa per quadrat).

The third floristic group was characterised by species group F, with an average species richness of eight taxa per quadrat (ranged from six to nine taxa per quadrat).

The fourth floristic group was characterised by quadrat 2, with a total species richness of seven taxa for this quadrat.

The fifth floristic group was characterised by species groups A and D, the average species richness was 13 taxa per quadrat (ranged from seven to 19 taxa per quadrat).

The sixth floristic group was characterised by species group A, the average species richness was 18 taxa per quadrat (ranged from 11 to 24 taxa per quadrat).

4.2.4 Species Richness and Accumulation Estimates

A total of 99 species were recorded within the 40 quadrats. The Chao 2 richness estimator provided an estimated species richness of 107 species in 60 sample sites (quadrats). A species accumulation curve was created to display the rate of species accumulation. The R^2 value (0.9947) suggests that the data “fits” the species accumulation curve shown in Figure 4-5. Species accumulation ranged from fourteen to five species per quadrat from 1-6 sample sites, four to three species per quadrat between 7-12 sample sites, two to one species per quadrat between 13-40 sample sites. Botanica has determined that according to this data, enough quadrats were established in the survey area to adequately assess the floristic composition of the area.

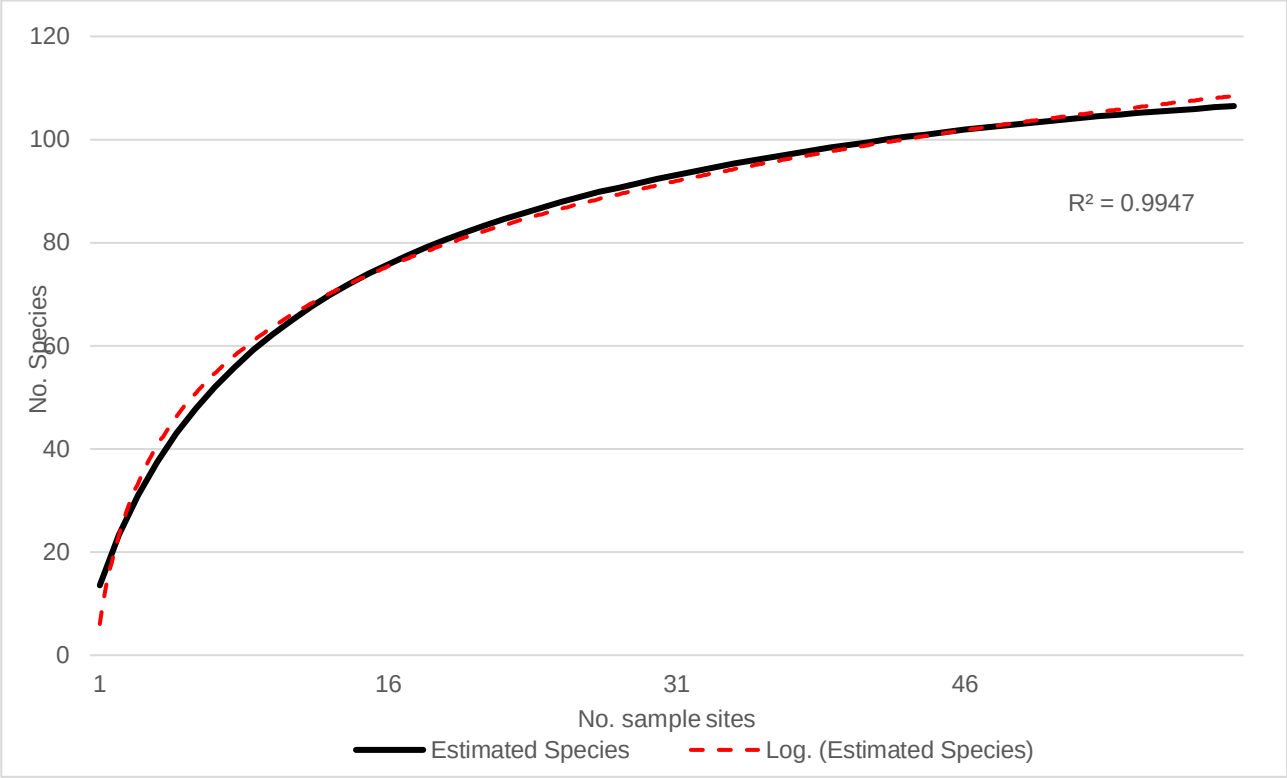


Figure 4-5: Species accumulation curve

4.2.5 Vegetation Condition

Based on the vegetation condition rating scale adapted from Keighery (1994) and Trudgen, (1988), native vegetation within the survey area was rated as 'Completely Degraded' to 'Very Good', with cleared areas considered 'Completely degraded' (Table 4-6, Figure 4-6). Vegetation condition rating descriptions are listed in Appendix D. Disturbances within the survey area include previous mining and exploration activities, pastoral land use, grazing by goats and occasional weeds and vehicle tracks.

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

Condition rating	Description (EPA, 2016a)	Area (ha)	Area (%)
Very Good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.	2170	25.1
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impacts on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.	3640	42.1
Completely Degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e., areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.	2841	32.8
	Total	**8651**	**100**

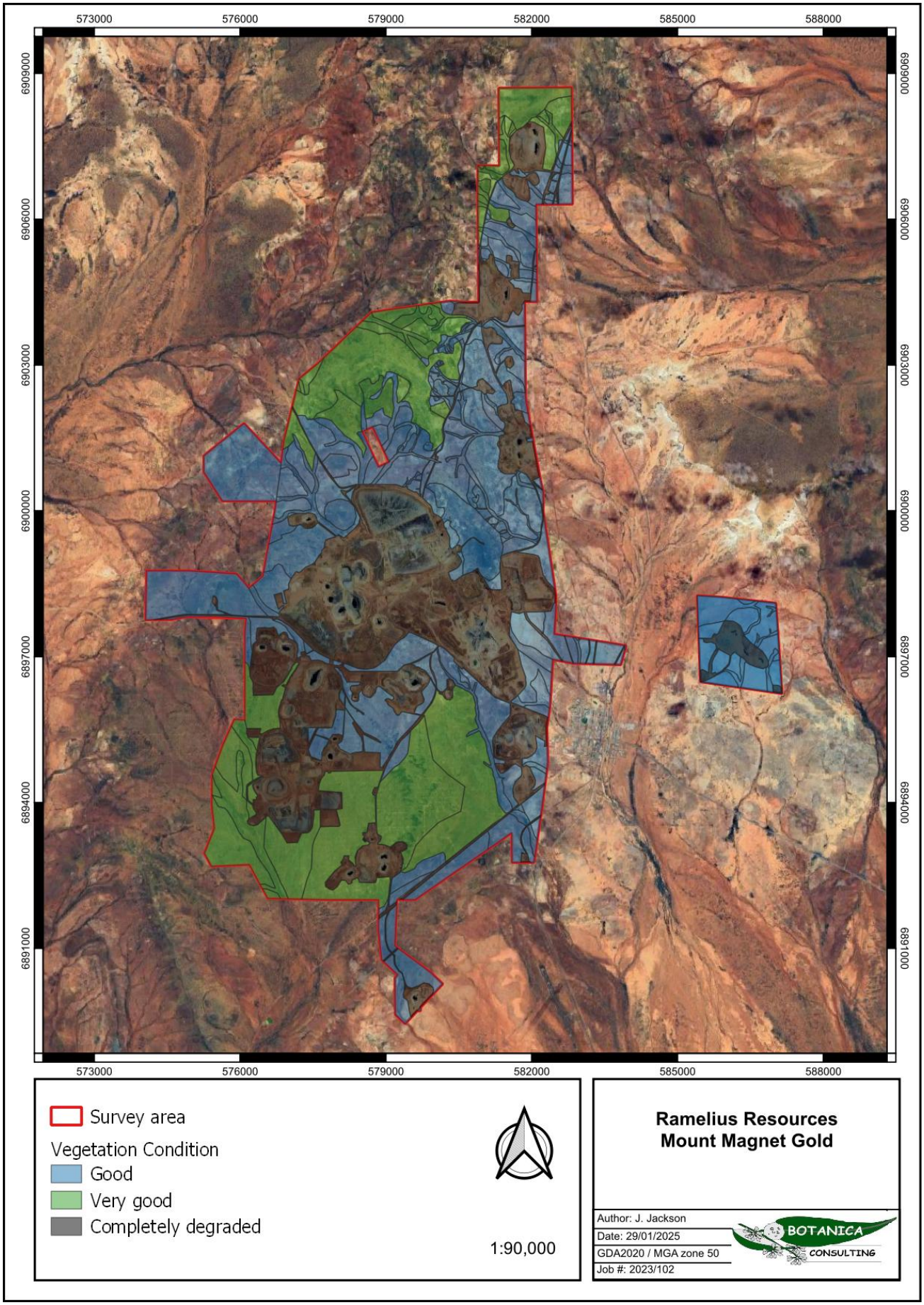


Figure 4-6: Vegetation condition within the survey area

4.2.6 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 TECs listed under State or Commonwealth legislation were identified within the survey area.

No PECs or other significant vegetation (as described above) was identified within the survey area.

According to the DBCA Ecological communities' data base search, there are two occurrences of the Priority 3 community Austin Land System within the survey area. The description of this community is 'Saline stony plains with low rises and drainage foci supporting low halophytic shrublands with scattered mulga; occurs mainly adjacent to lakes Austin and Annean below greenstone hill systems'. Botanica considers that the vegetation communities observed within the survey area do not match this description, given that Lake Austin is 24 km northeast of the survey area, and Lake Annean is 120 km north of the survey area. The vegetation communities observed in the survey area are not in any way unique and are considered to be of low biological diversity and are well represented outside the survey area.

4.2.7 Fauna

4.2.7.1 Fauna Habitat

Based on vegetation and associated landforms identified during the flora and vegetation assessment, four broad scale terrestrial fauna habitats were identified as occurring within the survey area. Table 4-8 provides the area and a visual representation of fauna habitat types, and the extent of fauna habitats is shown spatially in Figure 4-7.

Table 4-7 provides a list of opportunistic observations of fauna species that was made during the field survey with a total of 25 fauna species observed.

Table 4-7: Fauna species observed during the field survey

Taxon	Common Name	Comments
Avifauna		
Aquila audax	Wedge-tailed eagle	Observed
Barnardius zonarius	Ringneck parrot	Observed
Cinclosoma castanotum	Chestnut quail-thrush	Observed
Coracina novaehollandiae	Black-faced cuckoo-shrike	Observed
Corvus coronoides	Australian raven	Observed
Corvus orru	Torresian crow	Heard
Cracticus torquatus	Grey butcherbird	Observed
Dromaius novaehollandiae	Emu	Observed
Geopelia cuneata	Diamond Dove	Observed
Grallina cyanoleuca	Magpie-lark	Observed
Gymnorhina tibicen	Australian magpie	Observed
Lichmera indistincta	Brown honey eater	Observed
Malurus splendens	Splendid fairy wren	Heard
Manorina flavigula	Yellow-throated Miner	Observed
Oreoica gutturalis	Crested bellbird	Heard
Phaps chalcoptera	Common bronzewing	Observed
Psephotellus varius	Mulga Parrot	Observed
Ptilonorhynchus guttatus	Western bowerbird	Active nest observed
Rhipidura leucophrys	Willie wagtail	Observed
Taeniopygia castanotis	Zebra finch	Observed
Mammals		
Canis lupus familiaris	Dog	Tracks observed
Capra aegagrus hircus	Goat	Observed
Felis catus	Cat	Tracks observed
Oryctolagus cuniculus	Rabbit	Scats Observed
Macropus sp.	Kangaroo and/or Euro	Tracks and Scats Observed

Table 4-8: Main terrestrial fauna habitats within the survey area

Fauna Habitat	Description	Representative Fauna Attributes	Example Image
Acacia open woodland on rocky or clay-loam plain Area= 2998 ha (38.5%)	Open *Acacia* woodland over *Eremophila* shrubland	• Ground not particularly suited to burrowing species. • Moderate diversity vegetation strata supporting a lower avifauna assemblage. • Low vegetation density and low leaf litter supporting some small reptiles.	
Acacia and/or *Eucalypt* woodland in drainage line Area=654 ha (8.4%)	Closed *Acacia* and/or *Eucalypt* woodland over mixed *Acacia* and *Eremophila* shrubland	• Ground moderately suited to burrowing species in some areas. • Moderate diversity vegetation strata supporting a good avifauna assemblage. • Moderate vegetation density and moderate leaf litter supporting small reptiles. • Source of water after rainfall events.	

Fauna Habitat	Description	Representative Fauna Attributes	Example Image
Acacia woodland on rocky slope and/or rocky hill Area=999 ha (12.8%)	Open and/or closed *Acacia* woodland over *Eremophila* shrubland and *Maireana* chenopod shrubland	• Ground not particularly suited to burrowing species. • Moderate diversity vegetation strata supporting a lower avifauna assemblage. • Potential refuge for small fauna under rocks, for example reptile fauna	
Chenopod shrubland on clay-loam plain Area=335 ha (4.3%)	Low *Maireana* and *Tecticornia* chenopod shrubland	• Ground not particularly suited to burrowing species. • Potential refuge for small fauna under shrubs, for example reptile fauna • Low vegetation density and leaf litter • Chenopod shrubs provide a food source to avifauna during drought conditions	
Cleared areas Area=2798 ha (36%)			

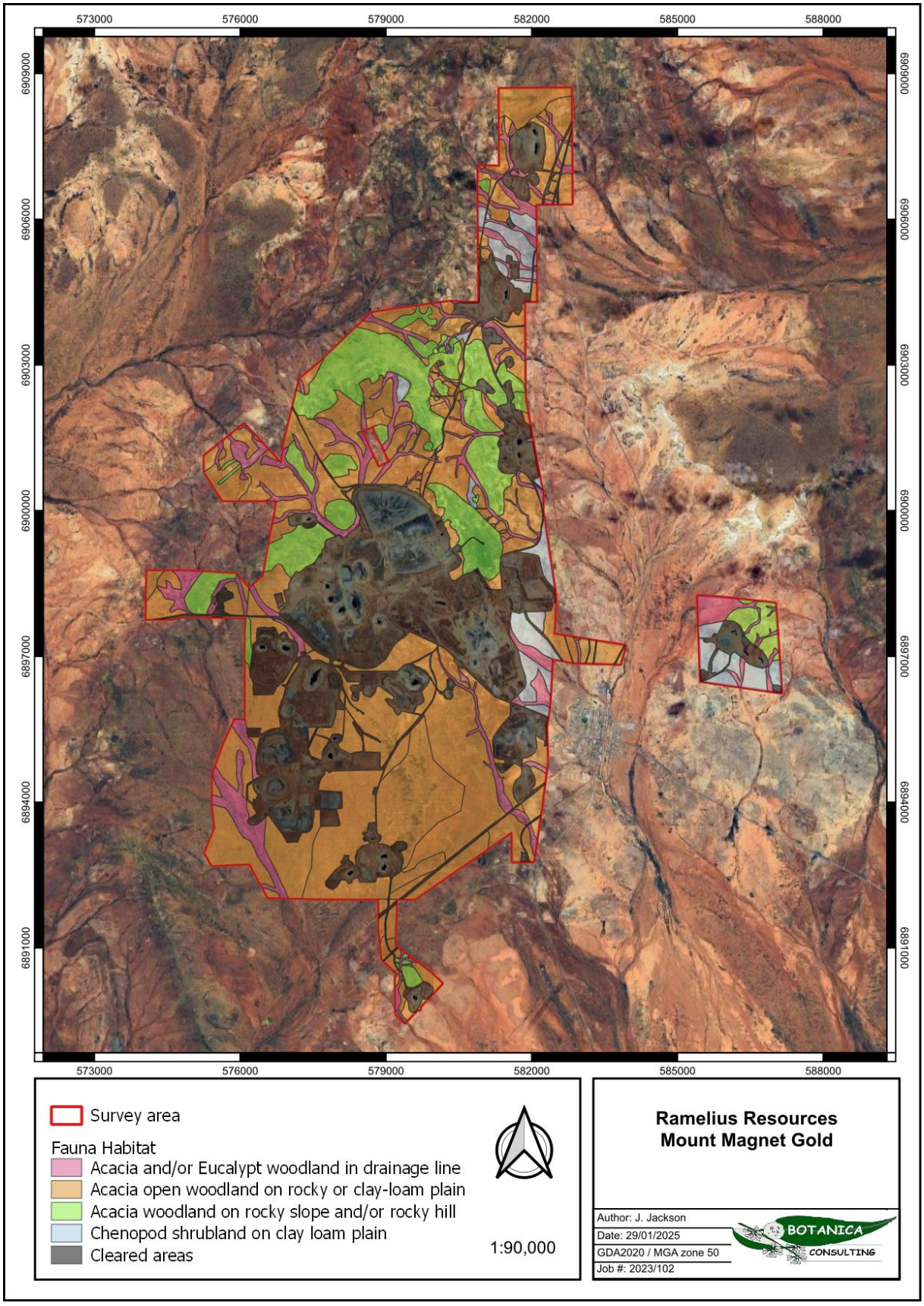


Figure 4-7: Fauna habitats within the survey area

4.2.7.2 Significant Fauna

According to the EPA *Environmental Factor Guideline for Terrestrial Fauna* (EPA, 2016c) 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 evidence of significant fauna species was observed during the survey.

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, in some cases, direct observations 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:

- **Southern whiteface (*Aphelocephala leucopsis)* - Vulnerable (EPBC Act)**

  This species is sparsely recorded throughout inland Australia. Suitable habitat may be present but is unlikely to represent critical habitat.

- **Peregrine Falcon (*Falco peregrinus*) - OS (DBCA)**

  This species is sparsely recorded throughout inland Australia. Suitable habitat may be present but is unlikely to represent critical habitat.

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

  This species is occasionally recorded in the Murchison bioregion. No old or active Malleefowl mounds were seen in the survey area and no scats, feathers or tracks were seen. The habitat observed was considered low potential for Malleefowl habitat, it consisted of an open canopy cover of woodland in most areas, and there were low levels of leaf litter, therefore very unlikely that Malleefowl would use this area for mound building.

- **Gilled slender blue-tongue (*Cyclodomorphus branchialis*) - VU (DBCA)**

  Previously recorded in the survey area in 2005. No evidence of the species was observed in the survey area. It is difficult to determine if it would still persist in the area.

It should be noted that while habitats onsite for one or more of 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.

4.3 Matters of National Environmental Significance

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act protects Matters of National Environmental Significance (MNES) and is used by the Commonwealth DAWE to list threatened taxa and ecological communities into categories based on the criteria set out in the EPBC Act (www.environment.gov.au/epbc/index.html). The EPBC 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. MNES as defined by the Commonwealth EPBC Act include:

- Nationally threatened flora and fauna 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 MNES were identified within the survey area.

4.4 Matters of State Environmental Significance

4.4.1 *Environmental Protection Act 1986* (WA)

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) 2004* (WA) any clearing of native vegetation in Western Australia that is not eligible for exemption under Schedule 6 of the EP Act or under the Regulations requires a clearing permit from the DWER or the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS). Under Section 51A of the EP Act 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 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 ESAs as declared under Section 51B of the EP Act or TEC listed under State and Commonwealth legislation.

No Environmentally Sensitive Areas were identified within the survey area.

4.4.2 *Biodiversity Conservation Act 2016*

The BC Act is used by the Western Australian DBCA 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 the BC Act all native flora and fauna are protected throughout the State. Financial penalties are enforced under the BC 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 flora species or critical habitat listed under the BC Act were recorded within the survey area.

4.5 Other Areas of Conservation Significance

The DBCA lists 'Priority' species and communities which are under consideration for declaration as 'Threatened' under the BC Act. These Priority species/ communities have no formal legal protection until they are endorsed by the Minister as being Threatened. Three Priority flora species were observed in the survey area, no PECs were identified in the survey area.

There are no wetlands of international importance (Ramsar Wetlands) or national importance (Australian Nature Conservation Agency Wetlands) within the survey area.

There are no proposed nor gazetted conservation reserves within the survey area. The nearest gazetted conservation reserve is the Lakeside Conservation Park (R53840), located approximately 34 km north of the survey area.

4.6 Native Vegetation Clearing Principles

Based on the outcomes from the survey undertaken, Botanica assessed the results of the desktop and field survey with regards to the native vegetation clearing principles listed under Schedule 5 of

the EP Act (Table 4-9). The assessment found that the proposed vegetation clearing activities may be at variance with clearing principle (f).

Table 4-9: Assessment against native vegetation clearing principles

Letter	Principal	Assessment	Outcome
Native vegetation should not be cleared if it:			
(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 outside of the survey area.	Clearing is not at variance with this principle
(b)	comprises the whole or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to WA.	The basic fauna search did not record any evidence for the presence of significant fauna or habitat within the survey area.	Clearing is not at variance with 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 with 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 or within 40 km.	Clearing is not at variance with this principle
(e)	is significant as a remnant of native vegetation in an area that has been extensively cleared	The Vegetation associations within the survey area retain >94% of their pre-European extent, and development within the survey area will not significantly reduce the current extent of these vegetation associations.	Clearing is not at variance with this principle
(f)	is growing, in, or in association with, an environment associated with a watercourse or wetland	There are no permanent/ perennial inland waters or drainage lines within the survey area. There are several minor ephemeral drainage lines occurring in the survey area.	Clearing may be at variance with this principle
(g)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	The survey area and surrounding region has not been extensively cleared. Clearing within the survey area is not considered likely to lead to land degradation issues such as salinity, water logging or acidic soils.	Clearing is not at variance with this principle
(h)	Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	The nearest gazetted conservation reserve is the Lakeside Conservation Park, located approximately 34 km north of the survey area. Clearing within the survey area will not impact this Reserve.	Clearing is not at variance with 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.	No surface water bodies are located within the survey area. There are several minor ephemeral drainage lines occurring in the survey area. Clearing within the survey area is not likely to impact underground water.	Clearing is unlikely to be at variance with this principle
(j)	Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.	Rainfall in the Eastern Murchison subregion has an average rainfall of 200mm. Rainfall events are unlikely to result in localised flooding. Clearing within the survey area is not likely to increase the incidence or intensity of flooding within the survey area or surrounds.	Clearing is unlikely to be at variance with this principle

5 BIBLIOGRAPHY

Atlas of Living Australia [ALA] (2024). *Spatial Portal. Atlas of Living Australia.* Available: https://spatial.ala.org.au/. Accessed June 2024.

Beard, J.S., (1990). *Plant Life of Western Australia*. Kangaroo Press Pty Ltd, NSW.

Birdlife (2024). *Bird Profiles.* Available: https://birdlife.org.au/bird-profiles/page/12/. Accessed April 2024.

BoM, (2025a). *Climate Data*. Bureau of Meteorology. Available: http://www.bom.gov.au/climate

BoM (2024). *Groundwater Dependent Ecosystems Atlas*. Bureau of Meteorology. Available: http://www.bom.gov.au/water/groundwater/gde/map.shtml

Botanica Consulting (2016). *Level 1 Flora and Vegetation Survey and Targeted Search for Flora and Fauna of Conservation Significance for the Checkers Plant Road.* Prepared for Mt Magnet Gold Pty Ltd. August 2016.

Cowan, M. (2001). *A Biodiversity Audit of Western Australia's 53 Biogeographical Region in 2001; Eastern Murchison (MUR01 –Eastern Murchison subregion)*. pp 143-155, Department of Conservation and Land Management, August 2001.

DBCA (2023a). *Threatened and Priority Flora database search* (Ref: 45-1123FL). Department of Biodiversity, Conservation and Attractions, WA.

DBCA (2023b). *Threatened and Priority Ecological Communities database search (Ref: 40-1123EC)*. Department of Biodiversity, Conservation and Attractions, WA.

DBCA (2023c). *Threatened and Priority Fauna database search* (Ref: 8068). Department of Biodiversity, Conservation and Attractions, WA.

DBCA (2024). *Dandjoo database search*. Department of Biodiversity, Conservation and Attractions, WA. Accessed on 13/06/2024.

DBCA (2024). *Guidelines for determining the likely presence and habitat usage of night parrot (Pezoporus occidentalis) in Western Australia.* Available WWW: https://www.dbca.wa.gov.au/management/threatened-species-and-communities/resources/threatened-and-priority-fauna-resources

Department of Climate Change, Energy, the Environment and Water [DCCEEW] (2020). *Interim Biogeographic Regionalisation for Australia v. 7* (IBRA).

DCCEEW (2024a). *Protected Matters Search Tool*. *Environment Protection and Biodiversity Conservation Act 1999*, Department of Climate Change, Energy the Environment and Water.

DCCEEW (2024b). *Species Profile and Threats Database*. Department of Climate Change, Energy the Environment and Water, Australian Government.

DotEE (2017). *National Vegetation Information System (NVIS) Major Vegetation Groups, Version 4.2.* Department of the Environment and Energy.

DPIRD (2019). *Pre-European Vegetation (DPIRD_006).* Department of Primary Industries and Regional Development, Western Australia, 24 July 2019.

DPIRD (2023). *Declared Organism database search*. Department of Primary Industries and Regional Development, Western Australia. Available: http://www.biosecurity.wa.gov.au/

EPA (2000). *Position Statement No.2. Environmental Protection of Native Vegetation in Western Australia, Clearing of Native Vegetation with Particular Reference to the Agricultural Area*. Environmental Protection Authority, Government of Western Australia, Perth. December 2000.

EPA (2016a). *Technical Guide - Flora and Vegetation Surveys for Environmental Impact Assessment – December 2016.* Environmental Protection Authority.

EPA (2016b). *Environmental Factor Guideline for Flora and Vegetation – December 2016.* Environmental Protection Authority.

Geoscience Australia (2015). *Surface Hydrology GIS*. Australian Government.

Government of Western Australia (2019). *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis. (Full Report).* Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth.

Government of Western Australia (2019). *Soil Landscape Mapping – Systems (DPIRD-064).* GIS data obtained from data.wa.gov.au, last updated 27 June 2019.

IUCN (2024). *The IUCN Red List of Threatened Species. Version 2024-1.* https://www.iucnredlist.org. Accessed on 12 July 2024.

Keighery, B. J., (1994). *Bushland Plant Survey: A guide to plant community survey for the community*. Wildflower Society of Western Australia (Inc.), Nedlands.

McDonald, R. C., Isbell, R. F., Speight, J. G., Walker, J. and Hopkins, M. S. (1998). *Australian Soil and Land Survey Field Handbook.* Inkata Press, Melbourne.

McKenzie, N.L., May J.E. and McKenna, S, (2002). *Bioregional Summary of the 2002 Biodiversity Audit for Western Australia.* Department of Conservation and Land Management, Perth.

Niche Environmental Services (2009). *Level 1 Flora and Vegetation Survey over the Galaxy Project Area.* Prepared for Harmony Gold Mt Magnet, September 2009.

Niche Environmental Services (2010a). *Level 1 Flora and Vegetation Survey over the Brown Hill Project Area*. Prepared for Harmony Gold Mt Magnet, March 2010.

Niche Environmental Services (2010b). *Level 1 Flora and Vegetation Survey over the Morning Star Project Area*. Prepared for Harmony Gold Mt Magnet, March 2010.

Niche Environmental Services (2010c). *Level 1 Flora and Vegetation Survey over the Perseverance Project Area.* Prepared for Harmony Gold Mt Magnet, March 2010.

Niche Environmental Services (2010d). *Level 1 Flora and Vegetation Survey over the Saturn Project Area.* Prepared for Harmony Gold Mt Magnet, March 2010.

Outback Ecology Services (2007a). *Blackman's Banded Ironstone Formations: Vegetation and Flora Survey.* Prepared for Mt Magnet Gold Pty Ltd. October 2007.

Outback Ecology Services (2007b). *Sirdar and Vicqueries Banded Ironstone Formations: Vegetation and Flora Survey*. Prepared for Harmony Gold Mt Magnet. August 2007.

Outback Ecology Services (2008). *Cavanaghs Banded Ironstone Formations: Vegetation and Flora Survey*. Prepared for Mt Magnet Gold Pty Ltd. March 2008.

Outback Ecology Services (2012). *Level 1 Flora and Vegetation Assessment and Terrestrial Fauna Desktop Study: Galaxy Mining Project.* Prepared for Mt Magnet Gold Pty Ltd. September 2012.

Tille, P. (2006). *Soil Landscapes of Western Australia's Rangelands and Arid Interior*. Department of Agriculture and Food Western Australia

Western Australian Herbarium (1998–). *Florabase—the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions. https://florabase.dpaw.wa.gov.au/ (Accessed June 2024).

Western Botanical (2006a). *Conservation Values of remnant flora and vegetation within current mining areas at Harmony Gold, Mt Magnet*. Prepared for Harmony Gold Mt Magnet, October 2006.

Western Botanical (2006b). *Preliminary Assessment of Conservation Values of Flora and Vegetation on Banded Ironstone Formations surrounding Harmony Gold operations, Mt Magnet*. Prepared for Harmony Gold Mt Magnet, October 2006.

APPENDIX A:
CONSERVATION RATINGS BC ACT AND EPBC ACT

Definitions of Conservation Significant Species

Code	Category
State categories of Threatened and Priority species	
Threatened Species (T) Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as Threatened species under section 26(2) of the Biodiversity Conservation Act 2016 (BC Act).	
CR	**Critically Endangered** Threatened species considered to be "facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for critically endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for critically endangered flora.
EN	**Endangered** Threatened species considered to be "facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for endangered flora.
VU	**Vulnerable** Threatened species considered to be "facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for vulnerable fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for vulnerable flora.
Extinct species Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.	
EX	**Extinct** Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act). Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.
EW	**Extinct in the Wild** Species that *"is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act). Currently there are no Threatened fauna or Threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.
Specially protected species Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection. Species that are listed as Threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.	
IA	**International Agreement/ Migratory** 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).

Code	Category
	Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species. Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.
CD	**Species of special conservation interest** Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as Threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act). Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.
OS	**Other specially protected species** Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act). Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.
Priority species Possibly Threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of Priority for survey and evaluation of conservation status so that consideration can be given to their declaration as Threatened Fauna or Flora. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.	
P1	**Priority 1: Poorly-known species** Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
P2	**Priority 2: Poorly-known species** Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
P3	**Priority 3: Poorly-known species** Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
P4	**Priority 4: Rare, Near Threatened and other species in need of monitoring** (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.
Commonwealth categories of Threatened species	

Code	Category
EX	**Extinct** Taxa where there is no reasonable doubt that the last member of the species has died.
EW	**Extinct in the Wild** 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.
CR	**Critically Endangered** 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.
EN	**Endangered** 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.
VU	**Vulnerable** 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.
CD	**Conservation Dependent** 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: (i) the species is a species of fish; (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; (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory; (iv) cessation of the plan of management would adversely affect the conservation status of the species.

Definitions of Conservation Significant Communities

Category Code	Category
State categories of Threatened Ecological Communities (TEC)	
PD	**Presumed Totally Destroyed**
	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:
	• records within the last 50 years have not been confirmed despite thorough searches or known likely habitats or;
	• all occurrences recorded within the last 50 years have since been destroyed.
CR	**Critically Endangered**
	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:
	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;
	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	**Endangered**
	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:

Category Code	Category
	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	**Vulnerable**
	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.
Commonwealth categories of Threatened Ecological Communities (TEC)	
CE	**Critically Endangered** 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	**Endangered** 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	**Vulnerable** 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).
Priority Ecological Communities	
P1	**Poorly-known ecological communities**
	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	**Poorly-known ecological communities**
	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	**Poorly known ecological communities**
	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;
	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	**Ecological communities that are adequately known, rare but not threatened** or meet criteria for near threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.
P5	**Conservation Dependent ecological communities**
	Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

APPENDIX B:
LIST OF SPECIES IDENTIFIED WITHIN THE SURVEY AREA

(W) denotes introduced (weed) species; (A) denotes ephemeral (annual) species; conservation significant species are shaded in light green.

Family	Taxon	DD-AOW1	DD-AFW1	DD-EW1	RS-AOW1	CLP-AOW1	CLP-AFW1	CLP-CS1	RS-AFW1	RH-AFW1	RH-AOW1	RP-AW1
Amaranthaceae	*Ptilotus aervoides (A)*	*	*					*				
Amaranthaceae	*Ptilotus beardii (P3)*										*	
Amaranthaceae	*Ptilotus exaltatus (A)*		*			*				*		
Amaranthaceae	*Ptilotus obovatus*	*	*	*	*	*	*	*	*	*		*
Amaranthaceae	*Ptilotus schwartzii*					*	*					
Amaranthaceae	*Ptilotus rotundifolius*				*				*			
Apocynaceae	*Alyxia tetanifolia (P3)*								*			
Apocynaceae	*Leichhardtia australis*			*					*			
Asteraceae	*Senecio magnificus (A)*					*				*		
Asteraceae	*Olearia muelleri*			*					*			
Chenopodiaceae	*Atriplex bunburyana*		*			*						*
Chenopodiaceae	*Atriplex codonocarpa (A)*		*							*		
Chenopodiaceae	*Enchylaena tomentosa*	*	*	*		*		*				*
Chenopodiaceae	*Maireana georgei*			*			*			*	*	
Chenopodiaceae	*Maireana oppositifolia*					*			*			
Chenopodiaceae	*Maireana pyramidata*	*	*			*		*		*		*
Chenopodiaceae	*Maireana triptera*	*	*	*	*	*		*	*			*
Chenopodiaceae	*Rhagodia eremaea*			*								*
Chenopodiaceae	*Rhagodia drummondii*		*	*		*		*	*			*
Chenopodiaceae	*Sclerolaena cuneata*					*						
Chenopodiaceae	*Sclerolaena densiflora*					*				*		*
Chenopodiaceae	*Sclerolaena diacantha*	*	*	*		*		*	*	*		

Family	Taxon	DD-AOW1	DD-AFW1	DD-EW1	RS-AOW1	CLP-AOW1	CLP-AFW1	CLP-CS1	RS-AFW1	RH-AFW1	RH-AOW1	RP-AW1
Chenopodiaceae	*Tecticornia disarticulata*	*	*	*		*		*	*			*
Colchicaceae	*Wurmbea tenella (A)*	*	*									
Droseraceae	*Drosera eremaea (P3)*	*										
Euphorbiaceae	*Euphorbia drummondii (A)*	*	*	*		*		*				
Fabaceae	*Acacia acuminata*	*	*	*		*		*				*
Fabaceae	*Acacia burrowsiana (P3)*								*	*		*
Fabaceae	*Acacia caesaneura*	*				*				*		
Fabaceae	*Acacia grasbyi*	*				*	*		*	*		*
Fabaceae	*Acacia incurvaneura*	*	*	*		*	*		*		*	*
Fabaceae	*Acacia oswaldii*	*							*	*		
Fabaceae	*Acacia pteraneura*					*			*	*		*
Fabaceae	*Acacia mulganeura*		*			*					*	*
Fabaceae	*Acacia exocarpoides*						*			*	*	
Fabaceae	*Acacia quadrimarginea*									*		
Fabaceae	*Acacia ramulosa* var. *ramulosa*	*	*		*	*	*	*	*		*	*
Fabaceae	*Acacia burkittii*	*								*		
Fabaceae	*Acacia aulacophylla*	*								*		
Fabaceae	*Acacia masliniana*									*		*
Fabaceae	*Acacia tetragonophylla*	*	*	*		*	*	*	*	*	*	*
Fabaceae	*Acacia aptaneura*	*				*	*		*		*	*
Fabaceae	*Acacia craspedocarpa*	*	*			*			*			
Fabaceae	*Acacia fuscaneura*				*							
Fabaceae	*Senna artemisioides* subsp. × *artemisioides*					*						
Fabaceae	*Senna artemisioides* subsp. *filifolia*					*			*			
Fabaceae	*Senna artemisioides* subsp. x *sturtii*											*
Fabaceae	*Senna glutinosa* subsp. *chatelainiana*	*								*		
Fabaceae	*Senna* sp. Meekatharra		*			*			*			*
Fabaceae	*Mirbelia rhagodioides*									*		
Geraniaceae	*Erodium cygnorum (A)*	*	*			*		*	*	*		*
Goodeniaceae	*Scaevola spinescens*	*	*	*		*			*			*

Family	Taxon	DD-AOW1	DD-AFW1	DD-EW1	RS-AOW1	CLP-AOW1	CLP-AFW1	CLP-CS1	RS-AFW1	RH-AFW1	RH-AOW1	RP-AW1
Haloragaceae	*Haloragis odontocarpa (A)*		*			*						*
Hemerocallidaceae	*Dianella revoluta*	*				*						*
Lamiaceae	*Teucrium teucriiflorum*	*					*		*			
Loranthaceae	*Amyema fitzgeraldii*	*				*		*				
Malvaceae	*Abutilon cryptopetalum*	*	*	*		*		*				
Malvaceae	*Brachychiton gregorii*	*					*		*	*		
Malvaceae	*Sida spodochroma*									*		
Malvaceae	*Sida calyxhymenia*	*	*	*		*		*	*		*	*
Malvaceae	*Sida ectogama*	*	*			*						*
Montiaceae	*Calandrinia eremaea (A)*	*										
Myrtaceae	*Eucalyptus striaticalyx*			*						*		
Myrtaceae	*Melaleuca hamata*											
Myrtaceae	*Melaleuca leiocarpa*			*					*	*		
Myrtaceae	*Thryptomene decussata*					*					*	
Nyctaginaceae	*Boerhavia coccinea*		*	*								*
Pittosporaceae	*Pittosporum angustifolium*		*			*						
Poaceae	*Aristida contorta (A)*	*				*		*				*
Poaceae	*Austrostipa elegantissima*								*			
Poaceae	*Enneapogon caerulescens*	*	*					*				*
Poaceae	*Eragrostis eriopoda*								*			
Poaceae	*Eragrostis dielsii (A)*	*	*					*				
Poaceae	*Chloris truncata*		*									
Poaceae	*Cenchrus ciliaris (W)*					*				*		
Proteaceae	*Grevillea berryana*					*	*					
Proteaceae	*Hakea preissii*	*	*			*		*		*		*
Proteaceae	*Hakea recurva* subsp. *arida*	*	*							*		
Pteridaceae	*Cheilanthes sieberi (A)*	*	*				*		*			
Pteridaceae	*Cheilanthes lasiophylla (A)*									*		
Rutaceae	*Philotheca brucei*									*		
Santalaceae	*Exocarpos aphyllus*		*	*					*	*		*
Sapindaceae	*Dodonaea rigida*						*		*			

Family	Taxon	DD-AOW1	DD-AFW1	DD-EW1	RS-AOW1	CLP-AOW1	CLP-AFW1	CLP-CS1	RS-AFW1	RH-AFW1	RH-AOW1	RP-AW1
Scrophulariaceae	*Eremophila forrestii*	*					*		*			
Scrophulariaceae	*Eremophila galeata*	*	*			*	*			*		
Scrophulariaceae	*Eremophila latrobei*	*				*	*		*		*	
Scrophulariaceae	*Eremophila spectabilis*	*					*			*		
Scrophulariaceae	*Eremophila oldfieldii* subsp. *angustifolia*	*	*	*						*		*
Scrophulariaceae	*Eremophila oppositifolia*			*								
Scrophulariaceae	*Eremophila pantonii*		*	*		*			*			
Scrophulariaceae	*Eremophila compacta*		*			*	*		*			*
Scrophulariaceae	*Eremophila exilifolia*	*			*	*	*			*		
Scrophulariaceae	*Eremophila punicea*	*	*		*	*	*			*		*
Scrophulariaceae	*Eremophila clarkei*	*	*			*	*		*		*	
Solanaceae	*Lycium australe*			*		*	*		*			
Solanaceae	*Nicotiana rosulata (A)*	*	*			*	*					
Solanaceae	*Solanum lasiophyllum*		*	*		*		*	*			*
Zygophyllaceae	*Tribulus astrocarpus*						*					

RH: rocky hill; RS: rocky slope; DD: drainage depression; CLP: clay loam plain; AW: Acacia woodland, EW: Eucalypt woodland; CS: chenopod shrublands.

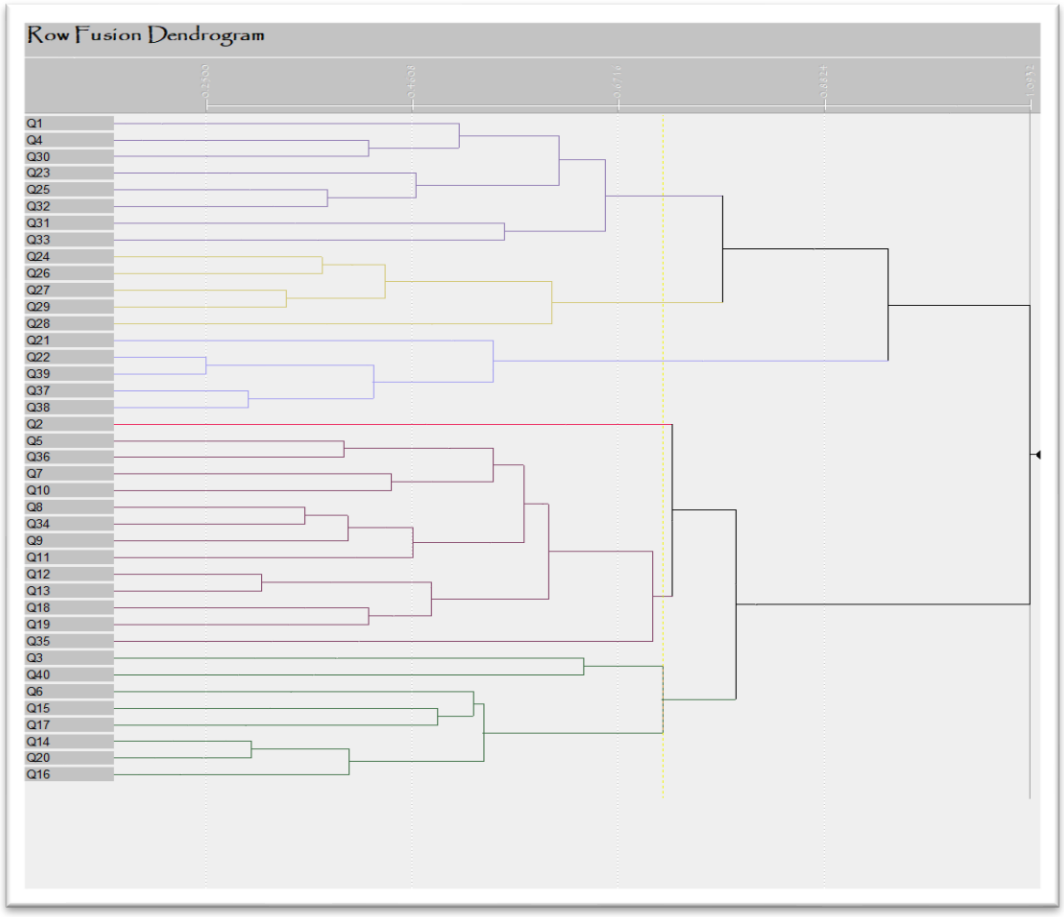
APPENDIX C:
QUADRAT LOCATIONS (GDA2020, ZONE 50)

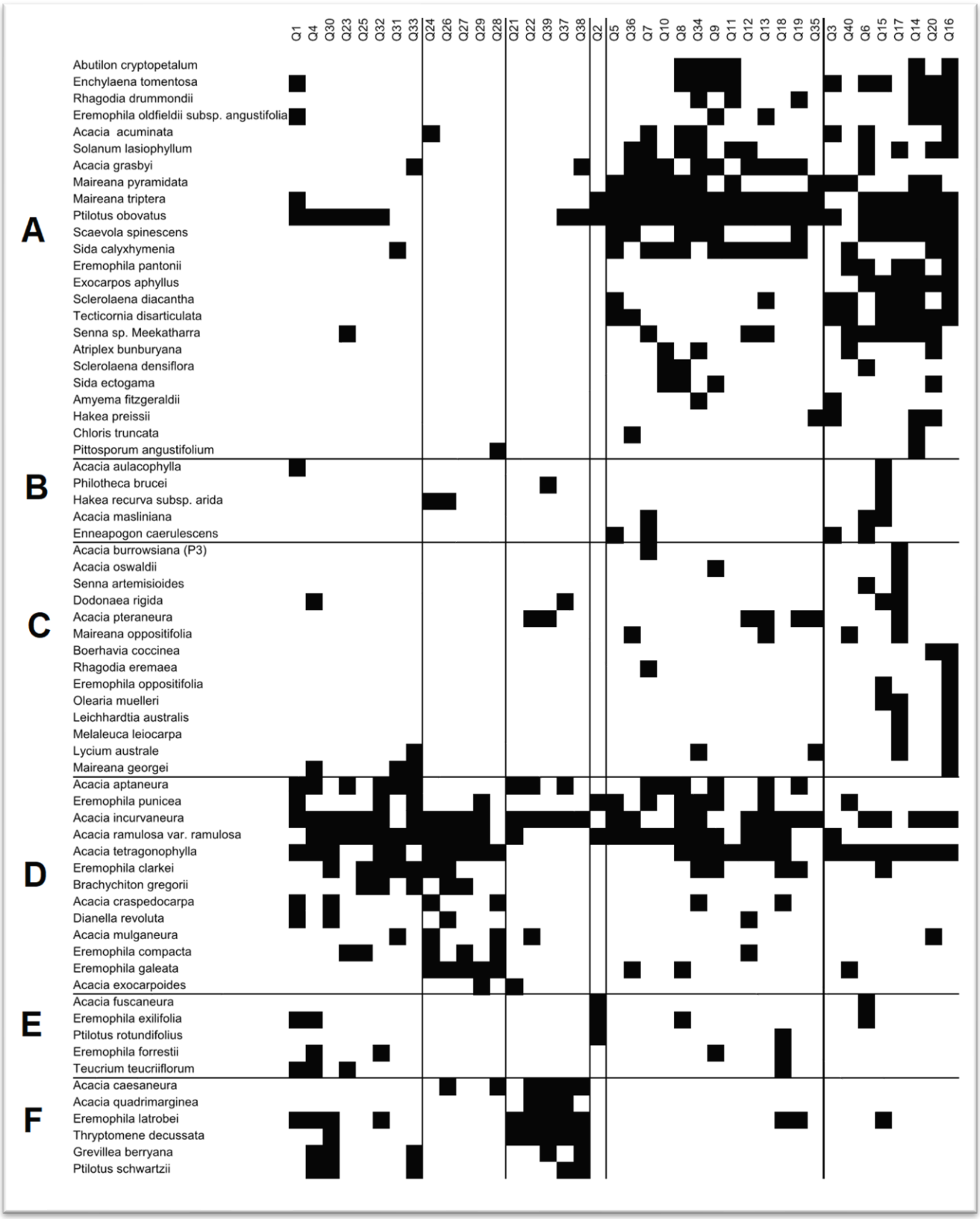
Quadrat	Easting	Northing
1	586120.988	6898132.6
2	586484.415	6897767.37
3	586316.362	6896585.57
4	581678.767	6908210.85
5	581547.088	6907261.08
6	581111.89	6906619.48
7	582511.721	6908436.48
8	582321.939	6906496.47
9	581142.178	6906151.98
10	581013.814	6905553.82
11	581384.738	6905425.79
12	581601.881	6903930.81
13	579252.966	6903950.75
14	580121.256	6904099.65
15	579984.913	6903902.36
16	580264.618	6903536.89
17	579954.388	6903099.36
18	580752.375	6902614.2
19	577523.54	6902100.51
20	578472.37	6900982.39
21	577551.965	6899639
22	580572.093	6899798.78
23	580959.09	6900956
24	580819.081	6901539.35
25	576182.769	6897171.27
26	575621.768	6894359.75
27	578533.286	6892241.02
28	577099.274	6892470.6
29	576660.438	6896141.57
30	576363.966	6898428.43
31	577317.718	6899032.63
32	579754.981	6894082.69
33	578425.278	6894108.27
34	580995.827	6895324.65
35	581695.333	6894719.21
36	581884.093	6893195.69
37	581026.384	6899304.15
38	580822.099	6899536.74
39	581134.332	6898768.1
40	583545.828	6897167.26

APPENDIX D:
VEGETATION CONDITION RATING

Vegetation Condition Rating	Southwest 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 E:
PATN ANALYSIS




Q1 Q4 Q30 Q23 Q25 Q32 Q31 Q33 Q24 Q26 Q27 Q29 Q28 Q21 Q22 Q39 Q37 Q38 Q2 Q5 Q36 Q7 Q10 Q8 Q34 Q9 Q11 Q12 Q13 Q18 Q19 Q35 Q3 Q40 Q6 Q15 Q17 Q14 Q20 Q16
A
Abutilon cryptopetalum
Enchylaena tomentosa
Rhagodia drummondii
Eremophila oldfieldii subsp. angustifolia
Acacia acuminata
Solanum lasiophyllum
Acacia grasbyi
Maireana pyramidata
Maireana triptera
Ptilotus obovatus
Scaevola spinescens
Sida calyxhymenia
Eremophila pantonii
Exocarpos aphyllus
Sclerolaena diacantha
Tecticornia disarticulata
Senna sp. Meekatharra
Atriplex bunburyana
Sclerolaena densiflora
Sida ectogama
Amyema fitzgeraldii
Hakea preissii
Chloris truncata
Pittosporum angustifolium
B
Acacia aulacophylla
Philotheca brucei
Hakea recurva subsp. arida
Acacia masliniana
Enneapogon caerulescens
C
Acacia burrowsiana (P3)
Acacia oswaldii
Senna artemisioides
Dodonaea rigida
Acacia pteraneura
Maireana oppositifolia
Boerhavia coccinea
Rhagodia eremaea
Eremophila oppositifolia
Olearia muelleri
Leichhardtia australis
Melaleuca leiocarpa
Lycium australe
Maireana georgei
D
Acacia aptaneura
Eremophila punicea
Acacia incurvaneura
Acacia ramulosa var. ramulosa
Acacia tetragonophylla
Eremophila clarkei
Brachychiton gregorii
Acacia craspedocarpa
Dianella revoluta
Acacia mulganeura
Eremophila compacta
Eremophila galeata
Acacia exocarpoides
E
Acacia fuscaneura
Eremophila exilifolia
Ptilotus rotundifolius
Eremophila forrestii
Teucrium teucriiflorum
F
Acacia caesaneura
Acacia quadrimarginea
Eremophila latrobei
Thryptomene decussata
Grevillea berryana
Ptilotus schwartzii

APPENDIX F:
QUADRAT DATA SHEETS

Project Name: MMG		
Date: 25/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):** 422-424
Quadrat No: Q1	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 448.5m
Coordinates (GDA2020): 586121E; 6898133N		**Waypoint (NW Corner):** 239
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Open depression/ Drainage depression		
Coarse fragments on the surface: Slightly; few (2-10%)/ Coarse gravelly; Large pebbles(20-60mm)/ Subangular		
Rock outcrop (abundance/runoff): Slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 10%		
Cover bare ground: 80%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: 10-30%	**Crown cover:** 10-30%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia aptaneura	*Eremophila exilifolia*	*Maireana triptera*

ALL TAXA
Acacia incurvaneura
Acacia aptaneura
Acacia aulacophylla
Acacia burkittii
Acacia craspedocarpa
Acacia tetragonophylla
Dianella revoluta
Enchylaena tomentosa
Eremophila latrobei
Eremophila oldfieldii subsp. *angustifolia*
Eremophila exilifolia
Eremophila punicea
Maireana triptera
Ptilotus obovatus
Teucrium teucriiflorum

Project Name: MMG		
Date: 25/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):** 427-429
Quadrat No: Q2	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 455m
Coordinates (GDA2020): 586484E; 6897767N		**Waypoint (NW Corner):** 240
Aspect: West	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Mid slope/ Hillslope		
Coarse fragments on the surface: Very; abundant(50-90%)/ Subangular		
Rock outcrop (abundance/runoff): Moderately Rapid		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: <10%		
Cover bare ground: 90%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 10-30%	**Crown cover:** <10%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia ramulosa var. *ramulosa*	*Eremophila exilifolia*	*Maireana triptera*

ALL TAXA
Acacia fuscaneura
Acacia ramulosa var. *ramulosa*
Eremophila exilifolia
Eremophila punicea
Maireana triptera
Ptilotus obovatus
Ptilotus rotundifolius

Project Name: MMG		
Date: 25/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**430-432
Quadrat No: Q3	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 443m
Coordinates (GDA2020): 586316E; 6896586N		**Waypoint (NW Corner):** 241
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** Good
Landform: Open depression/ Drainage depression		
Coarse fragments on the surface: Moderately; many(20-50%)/Coarse gravelly; large pebbles(20-60mm)/ Subangular		
Rock outcrop (abundance/runoff): Slow		
Soil (profile/field texture/soil surface): Clay loam/ Firm		
Cover leaf litter: 10%		
Cover bare ground: 80%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: 10-30%	**Crown cover:** 10-30%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia ramulosa var. *ramulosa*	*Acacia tetragonophylla*	*Maireana pyramidata*

ALL TAXA
Acacia acuminata
Acacia ramulosa var. *ramulosa*
Acacia tetragonophylla
Amyema fitzgeraldii
Aristida contorta (A)
Enchylaena tomentosa
Enneapogon caerulescens
Eragrostis dielsii
Erodium cygnorum (A)
Euphorbia drummondii (A)
Hakea preissii
Maireana pyramidata
Ptilotus aervoides
Ptilotus obovatus
Sclerolaena diacantha
Tecticornia disarticulata

Project Name: MMG		
Date: 25/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**435-437
Quadrat No: Q4	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 505m
Coordinates (GDA2020): 581679E; 6908211N		**Waypoint (NW Corner):** 243
Aspect: North	**Fire (yrs):** Long unburnt	**Condition rating:** Good
Landform: Flat/ Plain		
Coarse fragments on the surface: Very; abundant(50-90%)/Medium gravelly; medium pebbles(20-60mm)/ Subrounded		
Rock outcrop (abundance/runoff): Very Slow		
Soil (profile/field texture/soil surface): Brown/Clay loam/ Firm		
Cover leaf litter: 15%		
Cover bare ground: 75%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Eremophila forrestii*	*Ptilotus obovatus*

ALL TAXA
Acacia aptaneura
Acacia incurvaneura
Acacia ramulosa var *ramulosa*
Acacia tetragonophylla
Dodonaea rigida
Eremophila forrestii
Eremophila latrobei
Eremophila exilifolia
Grevillea berryana
Maireana georgei
Ptilotus obovatus
Ptilotus schwartzii
Teucrium teucriiflorum

Project Name: MMG		
Date: 25/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**438-440
Quadrat No: Q5	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 501m
Coordinates (GDA2020): 581547E; 6907261N		**Waypoint (NW Corner):** 244
Aspect: North	**Fire (yrs):** Long unburnt	**Condition rating:** Good
Landform: Open depression/ Drainage depression		
Coarse fragments on the surface: Moderately; many(20-50%)/Medium gravelly; medium pebbles(6-20mm)/ Subangular		
Rock outcrop (abundance/runoff): Slow		
Soil (profile/field texture/soil surface): Brown/Clay loam/ Firm		
Cover leaf litter: 20%		
Cover bare ground: 70%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 0.5-1m	**Height:** 0.5-1m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Eremophila punicea*	*Maireana pyramidata*

ALL TAXA
Acacia incurvaneura
Acacia ramulosa
Enneapogon caerulescens (A)
Eragrostis dielsii (A)
Eremophila punicea
Erodium cygnorum (A)
Euphorbia drummondii (A)
Haloragis odontocarpa (A)
Maireana pyramidata
Maireana triptera
Ptilotus obovatus
Scaevola spinescens
Sclerolaena diacantha
Sida calyxhymenia
Tecticornia disarticulata
Wurmbea tenella (A)

Project Name: MMG		
Date: 25/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**444-446
Quadrat No: Q6	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 512m
Coordinates (GDA2020): 581112E; 6906619N		**Waypoint (NW Corner):** 245
Aspect: East	**Fire (yrs):** Long unburnt	**Condition rating:** Good
Landform: Mid slope/ Hillslope		
Coarse fragments on the surface: Very; Abundant(50-90%)/Cobbly; or cobbles(60-200mm)/ Subangular		
Rock outcrop (abundance/runoff): Rapid		
Soil (profile/field texture/soil surface): Brown/Clay loam/ Firm		
Cover leaf litter: 15%		
Cover bare ground: 75%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** <10%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia fuscaneura	*Acacia tetragonophylla*	*Maireana triptera*

ALL TAXA
Acacia acuminata
Acacia grasbyi
Acacia fuscaneura
Acacia masliniana
Acacia incurvaneura
Acacia tetragonophylla
Cheilanthes lasiophylla
Enchylaena tomentosa
Enneapogon caerulescens
Eremophila pantonii
Eremophila exilifolia
Erodium cygnorum (A)
Exocarpos aphyllus
Maireana triptera
Mirbelia rhagodioides
Ptilotus obovatus
Scaevola spinescens
Sclerolaena densiflora
Senna artemisioides subsp. ×*artemisioides*
Senna artemisioides subsp*. x sturtii*
Senna glutinosa subsp*. chatelainiana*
Senna sp. Meekatharra
Solanum lasiophyllum

Project Name: MMG		
Date: 25/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**447-449
Quadrat No: Q7	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 505m
Coordinates (GDA2020): 582511E; 6908436N		**Waypoint (NW Corner):** 245
Aspect: South East	**Fire (yrs):** Long unburnt	**Condition rating:** Good
Landform: Flat Plain		
Coarse fragments on the surface: Very; Abundant(50-90%)/Medium gravelly; medium pebbles (6-20mm)/ Subangular		
Rock outcrop (abundance/runoff): Very Slow		
Soil (profile/field texture/soil surface): Brown/Clay loam/ Firm		
Cover leaf litter: 10%		
Cover bare ground: 80%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 10-30%	**Crown cover:** 10-30%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia aptaneura	*Acacia masliniana*	*Maireana triptera*

ALL TAXA
Acacia acuminata
Acacia aptaneura
Acacia grasbyi
Acacia ramulosa var ramulosa
Acacia masliniana
Acacia burrowsiana (P3)
Enneapogon caerulescens (A)
Eremophila punicea
Maireana pyramidata
Maireana triptera
Ptilotus obovatus
Rhagodia eremaea
Senna sp. Meekatharra
Sida calyxhymenia
Solanum lasiophyllum

Project Name: MMG		
Date: 25/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**450-452
Quadrat No: Q8	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 496m
Coordinates (GDA2020): 581142E; 6906496N		**Waypoint (NW Corner):** 252
Aspect: South West	**Fire (yrs):** Long unburnt	**Condition rating:** Good
Landform: Flat Plain		
Coarse fragments on the surface: No qualifier; common (10-20%)/Medium gravelly; medium pebbles (6-20mm)/ Subangular		
Rock outcrop (abundance/runoff): Very Slow		
Soil (profile/field texture/soil surface): Brown/Clay loam/ Firm		
Cover leaf litter: 20%		
Cover bare ground: 70%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Shrub	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia aptaneura	*Acacia acuminata*	*Ptilotus obovatus*

ALL TAXA
Abutilon cryptopetalum
Acacia acuminata
Acacia incurvaneura
Acacia aptaneura
Acacia ramulosa var ramulosa
Acacia tetragonophylla
Asteraceae seedlings
Enchylaena tomentosa
Eremophila galeata
Eremophila exilifolia
Eremophila punicea
Erodium cygnorum (A)
Euphorbia drummondii (A)
Haloragis odontocarpa (A)
Maireana pyramidata
Maireana triptera
Ptilotus exaltatus (A)
Ptilotus obovatus
Scaevola spinescens
Sclerolaena densiflora
Senecio magnificus (A)
Sida calyxhymenia
Sida ectogama
Solanum lasiophyllum

Project Name: MMG		
Date: 25/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**453-455
Quadrat No: Q9	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 502m
Coordinates (GDA2020): 581142E; 6906152N		**Waypoint (NW Corner):** 253
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** Good
Landform: Open depression/ Drainage depression		
Coarse fragments on the surface: Slightly; few (2-10%)/ Fine gravelly; small pebbles (2-6mm)/ Subangular		
Rock outcrop (abundance/runoff): Very Slow		
Soil (profile/field texture/soil surface): Brown/Clay loam/ Firm		
Cover leaf litter: 20%		
Cover bare ground: 70%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia aptaneura	*Eremophila forrestii*	*Maireana triptera*

ALL TAXA
Abutilon cryptopetalum
Acacia grasbyi
Acacia aptaneura
Acacia oswaldii
Acacia ramulosa
Acacia tetragonophylla
Cheilanthes sieberi
Enchylaena tomentosa
Eremophila forrestii
Eremophila oldfieldii subsp. *angustifolia*
Eremophila punicea
Eremophila clarkei
Erodium cygnorum (A)
Maireana triptera
Ptilotus obovatus
Scaevola spinescens
Senna charlesiana
Sida calyxhymenia
Sida ectogama

Project Name: MMG		
Date: 25/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**456-458
Quadrat No: Q10	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 502m
Coordinates (GDA2020): 581014E; 5810134N		**Waypoint (NW Corner):** 254
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** Good
Landform: Flat/ Plain		
Coarse fragments on the surface: Very; abundant(50-90%)/ Medium gravelly; medium pebbles (6-20mm)/ Subangular		
Rock outcrop (abundance/runoff): Very Slow		
Soil (profile/field texture/soil surface): Brown/Clay loam/ Firm		
Cover leaf litter: 10%		
Cover bare ground: 80%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 10-30%	**Crown cover:** 10-30%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia aptaneura	*Acacia grasbyi*	*Maireana triptera*

ALL TAXA
Acacia grasbyi
Acacia aptaneura
Acacia ramulosa
Aristida contorta (A)
Atriplex bunburyana
Erodium cygnorum (A)
Haloragis odontocarpa (A)
Maireana pyramidata
Maireana triptera
Ptilotus obovatus
Sclerolaena densiflora
Sida calyxhymenia
Sida ectogama

Project Name: MMG		
Date: 25/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**464-466
Quadrat No: Q11	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 465m
Coordinates (GDA2020): 581385E; 6905426N		**Waypoint (NW Corner):** 258
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** poor
Landform: Flat/ Plain		
Coarse fragments on the surface: Moderately; many(20-50%)/ Fine gravelly; small pebbles (2-6mm)/ Subangular		
Rock outcrop (abundance/runoff): Very Slow		
Soil (profile/field texture/soil surface): Clay loam/ Firm		
Cover leaf litter: 20%		
Cover bare ground: 70%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form:	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height:	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover:	**Crown cover:** <1%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
	Acacia tetragonophylla	*Maireana pyramidata*

ALL TAXA
Abutilon cryptopetalum
Acacia tetragonophylla
Asteraceae seedlings
Enchylaena tomentosa
Erodium cygnorum (A)
Maireana pyramidata
Maireana triptera
Ptilotus obovatus
Rhagodia eremaea
Sida calyxhymenia
Solanum lasiophyllum

Project Name: MMG		
Date: 25/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**474-476
Quadrat No: Q12	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 462m
Coordinates (GDA2020): 581602E; 6903931N		**Waypoint (NW Corner):** 267
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** Good
Landform: Flat/ Plain		
Coarse fragments on the surface: Very; abundant (50-90%)/ medium gravelly; medium pebbles (2-6mm)/ Subangular		
Rock outcrop (abundance/runoff):		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 20%		
Cover bare ground: 70%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Acacia grasbyi*	*Maireana triptera*

ALL TAXA
Acacia grasbyi
Acacia incurvaneura
Acacia pteraneura
Acacia ramulosa
Acacia tetragonophylla
Dianella revoluta
Eremophila compacta
Maireana triptera
Ptilotus obovatus
Senna sp. Meekatharra
Sida calyxhymenia
Solanum lasiophyllum

Project Name: MMG		
Date: 25/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**478-480
Quadrat No: Q13	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 462m
Coordinates (GDA2020): 579253E; 6903951N		**Waypoint (NW Corner):** 269
Aspect: South West	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Flat/ Plain		
Coarse fragments on the surface: Moderately; many (20-50%)/ medium gravelly; medium pebbles (6-20mm)/ Subangular		
Rock outcrop (abundance/runoff): Very Slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 20%		
Cover bare ground: 70%		

Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia aptaneura	*Senna* sp. Meekatharra	*Maireana triptera*

ALL TAXA
Acacia grasbyi
Acacia incurvaneura
Acacia aptaneura
Acacia pteraneura
Acacia ramulosa var *ramulosa*
Acacia tetragonophylla
Eremophila oldfieldii subsp. *angustifolia*
Eremophila punicea
Erodium cygnorum (A)
Maireana oppositifolia
Maireana triptera
Ptilotus obovatus
Sclerolaena diacantha
Senna sp. Meekatharra
Sida calyxhymenia

Project Name: MMG		
Date: 25/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**481-483
Quadrat No: Q14	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 460m
Coordinates (GDA2020): 580121E; 6904100N		**Waypoint (NW Corner):** 271
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Open depression/ Drainage depression		
Coarse fragments on the surface: Moderately; many (20-50%)/ medium gravelly; medium pebbles (6-20mm)/ Subangular		
Rock outcrop (abundance/runoff): Slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 15%		
Cover bare ground: 75%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** 30-70%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Acacia tetragonophylla*	*Tecticornia disarticulata*

ALL TAXA
Abutilon cryptopetalum
Acacia incurvaneura
Acacia tetragonophylla
Atriplex codonocarpa (A)
Enchylaena tomentosa
Eremophila oldfieldii subsp. *angustifolia*
Eremophila pantonii
Erodium cygnorum (A)
Euphorbia drummondii (A)
Exocarpos aphyllus
Chloris truncata (A)
Hakea preissii
Maireana pyramidata
Maireana triptera
Pittosporum angustifolium
Ptilotus aervoides (A)
Ptilotus exaltatus (A)
Ptilotus obovatus
Rhagodia eremaea
Scaevola spinescens
Sclerolaena diacantha
Senna sp. Meekatharra
Tecticornia disarticulata

Project Name: MMG		
Date: 26/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**484-486
Quadrat No: Q15	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 472m
Coordinates (GDA2020): 579985E; 6903902N		**Waypoint (NW Corner):** 272
Aspect: South East	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Upper slope/ Hillslope		
Coarse fragments on the surface: Very; abundant (20-50%)/ medium gravelly; medium pebbles (6-20mm)/ Subangular		
Rock outcrop (abundance/runoff): Moderately rapid		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 15%		
Cover bare ground: 75%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Scaevola spinescens*	*Maireana triptera*

ALL TAXA
Acacia incurvaneura
Acacia masliniana
Acacia aulacophylla
Acacia tetragonophylla
Dodonaea rigida
Enchylaena tomentosa
Eremophila latrobei
Eremophila oppositifolia
Eremophila clarkei
Exocarpos aphyllus
Hakea recurva subsp. *arida*
Maireana triptera
Melaleuca hamata
Olearia muelleri
Philotheca brucei
Ptilotus obovatus
Scaevola spinescens
Sclerolaena diacantha
Senna sp. Meekatharra
Tecticornia disarticulata

Project Name: MMG		
Date: 26/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**487-489
Quadrat No: Q16	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 460m
Coordinates (GDA2020): 580265E; 6903537N		**Waypoint (NW Corner):** 273
Aspect: South West	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Flat/ Open depression/ Drainage depression		
Coarse fragments on the surface: Moderately; many (20-50%)/ medium gravelly; medium pebbles (6-20mm)/ Subangular		
Rock outcrop (abundance/runoff):		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 35%		
Cover bare ground: 55%		

Upper stratum	Mid-stratum	Lower stratum
Growth form: Tree Mallee	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 6-12 m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Eucalyptus striaticalyx	*Melaleuca leiocarpa*	*Tecticornia disarticulata*

ALL TAXA
Abutilon cryptopetalum
Acacia acuminata
Acacia incurvaneura
Acacia tetragonophylla
Boerhavia coccinea
Enchylaena tomentosa
Eremophila oldfieldii subsp. angustifolia
Eremophila oppositifolia
Eremophila pantonii
Eucalyptus striaticalyx
Euphorbia drummondii (A)
Exocarpos aphyllus
Leichhardtia australis
Lycium australe
Maireana georgei
Maireana triptera
Melaleuca leiocarpa
Olearia muelleri
Ptilotus obovatus
Rhagodia eremaea
Rhagodia eremaea
Scaevola spinescens
Sclerolaena diacantha
Sida calyxhymenia
Solanum lasiophyllum
Tecticornia disarticulata

Project Name: MMG		
Date: 26/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**490-492
Quadrat No: Q17	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 472m
Coordinates (GDA2020): 579954E; 6903099N		**Waypoint (NW Corner):** 277
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Upper slope/ Hillslope		
Coarse fragments on the surface: Very; Abundant (50-90%)/ medium gravelly; medium pebbles (6-20mm)/ Subangular		
Rock outcrop (abundance/runoff):		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 15%		
Cover bare ground: 75%		

Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Shrub	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 10-30%	**Crown cover:** 10-30%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia burrowsiana	*Senna* sp. Meekatharra	*Tecticornia disarticulata*

ALL TAXA
Acacia burrowsiana (P3)
Acacia oswaldii
Acacia pteraneura
Acacia tetragonophylla
Alyxia tetanifolia (P3)
Austrostipa elegantissima
Dodonaea rigida
Eremophila pantonii
Exocarpos aphyllus
Leichhardtia australis
Lycium australe
Maireana oppositifolia
Maireana triptera
Melaleuca leiocarpa
Olearia muelleri
Ptilotus obovatus
Scaevola spinescens
Sclerolaena diacantha
Senna artemisioides subsp. *filifolia*
Senna sp. Meekatharra
Solanum lasiophyllum
Tecticornia disarticulata

Project Name: MMG		
Date: 26/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**501-503
Quadrat No: Q18	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 472m
Coordinates (GDA2020): 580752E; 6902614N		**Waypoint (NW Corner):** 279
Aspect: South West	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Mid slope/ Hillslope		
Coarse fragments on the surface: Very; Abundant (50-90%)/ Coarse gravelly; large pebbles (20-60mm)/ Subangular		
Rock outcrop (abundance/runoff):		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 15%		
Cover bare ground: 75%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Acacia ramulosa*	*Maireana triptera*

ALL TAXA
Acacia grasbyi
Acacia incurvaneura
Acacia craspedocarpa
Acacia ramulosa
Acacia tetragonophylla
Eremophila forrestii
Eremophila latrobei
Eremophila clarkei
Maireana triptera
Ptilotus obovatus
Ptilotus rotundifolius
Sida calyxhymenia
Teucrium teucriiflorum

Project Name: MMG		
Date: 26/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**514-516
Quadrat No: Q19	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 493m
Coordinates (GDA2020): 577524E; 6902101N		**Waypoint (NW Corner):** 283
Aspect: East	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Mid slope/ Hillslope		
Coarse fragments on the surface: Very; Abundant (50-90%)/ Medium gravelly; medium pebbles (20-60mm)/ Subangular		
Rock outcrop (abundance/runoff): Moderately Rapid		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 15%		
Cover bare ground: 75%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia aptaneura	*Acacia grasbyi*	*Maireana triptera*

ALL TAXA
Acacia grasbyi
Acacia incurvaneura
Acacia aptaneura
Acacia pteraneura
Eremophila latrobei
Eremophila clarkei
Erodium cygnorum (A)
Maireana triptera
Ptilotus obovatus
Rhagodia drummondii
Scaevola spinescens
Sida calyxhymenia

Project Name: MMG		
Date: 26/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**517-519
Quadrat No: Q20	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 471m
Coordinates (GDA2020): 578472E; 6900982N		**Waypoint (NW Corner):** 284
Aspect: East	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Open depression/ Drainage depression		
Coarse fragments on the surface: Moderately; many (50-90%)/ Medium gravelly; medium pebbles (20-60mm)/ Subangular		
Rock outcrop (abundance/runoff): Slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 15%		
Cover bare ground: 75%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Acacia tetragonophylla*	*Atriplex bunburyana*

ALL TAXA
Acacia incurvaneura
Acacia mulganeura
Acacia tetragonophylla
Atriplex bunburyana
Boerhavia coccinea
Enchylaena tomentosa
Eremophila oldfieldii subsp. *angustifolia*
Exocarpos aphyllus
Hakea preissii
Maireana pyramidata
Maireana triptera
Ptilotus obovatus
Rhagodia drummondii
Scaevola spinescens
Senna sp. Meekatharra
Sida calyxhymenia
Sida ectogama
Solanum lasiophyllum
Tecticornia disarticulata

Project Name: MMG		
Date: 26/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**521-523
Quadrat No: Q21	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 480m
Coordinates (GDA2020): 577552E; 6899639N		**Waypoint (NW Corner):** 287
Aspect: North	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Mid slope/ Hillslope		
Coarse fragments on the surface: Very; abundant (50-90%)/ Medium gravelly; medium pebbles (20-60mm)/ Subangular		
Rock outcrop (abundance/runoff): Moderately rapid		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 20%		
Cover bare ground: 70%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:**
Height: 3-6m	**Height:** 1-3m	**Height:**
Crown cover: 30-70%	**Crown cover:** <10%	**Crown cover:**
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia aptaneura	*Thryptomene decussata*	No dominant
ALL TAXA		
Acacia exocarpoides		
Acacia incurvaneura		
Acacia aptaneura		
Acacia ramulosa var *ramulosa*		
Eremophila latrobei		
Thryptomene decussata		

Project Name: MMG		
Date: 26/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**524-526
Quadrat No: Q22	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 508m
Coordinates (GDA2020): 580572E; 6899799N		**Waypoint (NW Corner):** 288
Aspect: South West	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Mid slope/ Hillslope		
Coarse fragments on the surface: Very; abundant (50-90%)/ Coarse gravelly; large pebbles (20-60mm)/ Subangular		
Rock outcrop (abundance/runoff): Slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 20%		
Cover bare ground: 70%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** <10%	**Crown cover:** <1%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia mulganeura	*Thryptomene decussata*	*Eremophila latrobei*

ALL TAXA
Acacia caesaneura
Acacia incurvaneura
Acacia aptaneura
Acacia mulganeura
Acacia pteraneura
Acacia quadrimarginea
Eremophila latrobei
Thryptomene decussata

Project Name: MMG		
Date: 26/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**529-531
Quadrat No: Q23	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 491m
Coordinates (GDA2020): 580959E; 6900956N		**Waypoint (NW Corner):** 289
Aspect: West	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Mid slope/ Hillslope		
Coarse fragments on the surface: Very; abundant (50-90%)/ Coarse gravelly; large pebbles (20-60mm)/ Subangular		
Rock outcrop (abundance/runoff): Moderately rapid		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 15%		
Cover bare ground: 75%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** <10%	**Crown cover:** <1%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia aptaneura	*Eremophila compacta*	*Ptilotus obovatus*

ALL TAXA
Acacia incurvaneura
Acacia aptaneura
Acacia ramulosa var *ramulosa*
Eremophila compacta
Ptilotus obovatus
Senna sp. Meekatharra
Teucrium teucriiflorum

Project Name: MMG		
Date: 26/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**533-535
Quadrat No: Q24	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 477m
Coordinates (GDA2020): 580819E; 6901539N		**Waypoint (NW Corner):** 290
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Open depression/ Drainage depression		
Coarse fragments on the surface: Very; abundant (50-90%)/ Coarse gravelly; large pebbles (20-60mm)/ Subangular		
Rock outcrop (abundance/runoff): Very slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 20%		
Cover bare ground: 70%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Fern
Height: 3-6m	**Height:** 0.5-1m	**Height:** <0.25m
Crown cover: 30-70%	**Crown cover:** <10%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia mulganeura	*Eremophila clarkei*	*Cheilanthes sieberi*

ALL TAXA
Acacia acuminata
Acacia incurvaneura
Acacia craspedocarpa
Acacia mulganeura
Acacia ramulosa
Acacia tetragonophylla
Asteraceae seedlings
Cheilanthes sieberi
Eragrostis dielsii (A)
Eremophila galeata
Eremophila compacta
Eremophila clarkei
Erodium cygnorum (A)
Hakea preissii
Nicotiana rosulata (A)
Wurmbea tenella (A)

Project Name: MMG		
Date: 27/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**536-538
Quadrat No: Q25	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 460m
Coordinates (GDA2020): 576183E; 6897171N		**Waypoint (NW Corner):** 291
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Flat/Plain		
Coarse fragments on the surface: No qualifier; common (10-20%)/ Fine gravelly; small pebbles (2-6mm)/ Subrounded		
Rock outcrop (abundance/runoff): Very slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 30%		
Cover bare ground: 60%		

Upper stratum	Mid-stratum	Lower stratum
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3 m	**Height:** 0.5-1m
Crown cover: 30-70%	**Crown cover:** 30-70%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Acacia ramulosa*	*Cheilanthes sieberi*

ALL TAXA
Acacia incurvaneura
Acacia ramulosa
Brachychiton gregorii
Cheilanthes sieberi
Eragrostis eriopoda
Eremophila compacta
Eremophila clarkei
Ptilotus obovatus

Project Name: MMG		
Date: 27/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**539-341
Quadrat No: Q26	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 445m
Coordinates (GDA2020): 575622E; 6894360N		**Waypoint (NW Corner):** 292
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Open depression/ drainage depression		
Coarse fragments on the surface: Very; Abundant (50-90%)/ Medium gravelly; medium pebbles (6-20mm)/ Subangular		
Rock outcrop (abundance/runoff): Very slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 20%		
Cover bare ground: 70%		

Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Eremophila galeata*	*Eremophila clarkei*

ALL TAXA
Acacia caesaneura
Acacia incurvaneura
Acacia ramulosa
Acacia tetragonophylla
Brachychiton gregorii
Calandrinia eremaea (A)
Dianella revoluta
Drosera eremaea (P3)
Eragrostis dielsii (A)
Eremophila galeata
Eremophila clarkei
Euphorbia drummondii (A)
Hakea recurva subsp. *arida*
Nicotiana rosulata (A)
Wurmbea tenella (A)

Project Name: MMG		
Date: 27/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**545-547
Quadrat No: Q27	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 438m
Coordinates (GDA2020): 578533E; 6892241N		**Waypoint (NW Corner):** 293
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Flat/ Plain		
Coarse fragments on the surface: Moderately; Many (20-50%)/ Medium gravelly; medium pebbles (60-20mm)/ Subangular		
Rock outcrop (abundance/runoff): Very slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 10%		
Cover bare ground: 80%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: <10%	**Crown cover:** <10%	**Crown cover:** <1%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Eremophila galeata*	*Eremophila compacta*

ALL TAXA
Acacia incurvaneura
Acacia ramulosa var *ramulosa*
Acacia tetragonophylla
Brachychiton gregorii
Eremophila galeata
Eremophila compacta

Project Name: MMG		
Date: 27/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**548-550
Quadrat No: Q28	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 439m
Coordinates (GDA2020): 577099E; 6892471N		**Waypoint (NW Corner):** 294
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** Good
Landform: Flat/ Plain		
Coarse fragments on the surface: No Qualifier; common (10-20%)/ Medium gravelly; medium pebbles (6-20mm)/ Subangular		
Rock outcrop (abundance/runoff): Very slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 10%		
Cover bare ground: 80%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: 10-30%	**Crown cover:** <10%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia caesaneura	*Eremophila galeata*	*Eremophila compacta*

ALL TAXA
Acacia caesaneura
Acacia craspedocarpa
Acacia mulganeura
Acacia tetragonophylla
Eremophila galeata
Eremophila compacta
Nicotiana rosulata (A)
Pittosporum angustifolium

Project Name: MMG		
Date: 27/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**551-553
Quadrat No: Q29	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 455m
Coordinates (GDA2020): 576660E; 6896142N		**Waypoint (NW Corner):** 295
Aspect: South East	**Fire (yrs):** Long unburnt	**Condition rating:** Good
Landform: Flat/ Plain		
Coarse fragments on the surface: Moderately; many (20-50%)/ Medium gravelly; medium pebbles (6-20mm)/ Subangular		
Rock outcrop (abundance/runoff): Very slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 15%		
Cover bare ground: 75%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Acacia ramulosa*	*Eremophila punicea*

ALL TAXA
Acacia exocarpoides
Acacia incurvaneura
Acacia ramulosa
Acacia tetragonophylla
Cheilanthes sieberi
Eremophila galeata
Eremophila punicea
Nicotiana rosulata (A)

Project Name: MMG		
Date: 27/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**554-556
Quadrat No: Q30	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 472m
Coordinates (GDA2020): 576364E; 6898428N		**Waypoint (NW Corner):** 296
Aspect: South West	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Flat/ Plain		
Coarse fragments on the surface: Very; abundant (50-90%)/ Medium gravelly; medium pebbles (6-20mm)/ Subrounded		
Rock outcrop (abundance/runoff): Slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 10%		
Cover bare ground: 80%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** <1%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia craspedocarpa	*Acacia ramulosa*	*Ptilotus schwartzii*

ALL TAXA
Acacia incurvaneura
Acacia craspedocarpa
Acacia ramulosa
Acacia tetragonophylla
Dianella revoluta
Eremophila latrobei
Eremophila clarkei
Grevillea berryana
Thryptomene decussata
Ptilotus obovatus
Ptilotus schwartzii

Project Name: MMG		
Date: 27/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**557-559
Quadrat No: Q31	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 485m
Coordinates (GDA2020): 577318E; 6899033N		**Waypoint (NW Corner):** 297
Aspect: South West	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Mid slope/ Hillslope		
Coarse fragments on the surface: Very; abundant (50-90%)/ Cobbly; or cobbles (60-200mm)/ Subangular		
Rock outcrop (abundance/runoff): Ironstone/ Moderately rapid		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 15%		
Cover bare ground: 75%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** <1%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia aptaneura	*Acacia ramulosa* var *ramulosa*	*Eremophila clarkei*
ALL TAXA		
Acacia aptaneura		
Acacia mulganeura		
Acacia ramulosa var *ramulosa*		
Acacia tetragonophylla		
Eremophila clarkei		
Maireana georgei		
Sida calyxhymenia		

Project Name: MMG		
Date: 27/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**560-562
Quadrat No: Q32	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 469m
Coordinates (GDA2020): 579755E; 6894083N		**Waypoint (NW Corner):** 298
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Flat/ Plain		
Coarse fragments on the surface: Moderately; many (20-50%)/ Medium gravelly; medium pebbles (6-20mm)/ Subangular		
Rock outcrop (abundance/runoff): Very Slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 20%		
Cover bare ground: 70%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: 30-70%	**Crown cover:** 30-70%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Acacia ramulosa* var *ramulosa*	*Eremophila clarkei*

ALL TAXA
Acacia incurvaneura
Acacia aptaneura
Acacia ramulosa var *ramulosa*
Acacia tetragonophylla
Brachychiton gregorii
Eremophila forrestii
Eremophila latrobei
Eremophila punicea
Eremophila clarkei
Eremophila spectabilis
Ptilotus obovatus

Project Name: MMG		
Date: 27/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**563-565
Quadrat No: Q33	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 472m
Coordinates (GDA2020): 578425E; 6894108N		**Waypoint (NW Corner):** 299
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Flat/ Plain		
Coarse fragments on the surface: Moderately; many (20-50%)/ Medium gravelly; medium pebbles (6-20mm)/ Subangular		
Rock outcrop (abundance/runoff): Very Slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 15%		
Cover bare ground: 75%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Acacia ramulosa*	*Eremophila punicea*

ALL TAXA
Acacia grasbyi
Acacia incurvaneura
Acacia aptaneura
Acacia ramulosa
Brachychiton gregorii
Eremophila punicea
Eremophila clarkei
Grevillea berryana
Lycium australe
Maireana georgei
Ptilotus schwartzii
Tribulus astrocarpus

Project Name: MMG		
Date: 27/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**566-568
Quadrat No: Q34	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 478m
Coordinates (GDA2020): 580996E; 6895325N		**Waypoint (NW Corner):** 300
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Open depression/ drainage depression		
Coarse fragments on the surface: Moderately; many (20-50%)/ Medium gravelly; medium pebbles (6-20mm)/ Subangular		
Rock outcrop (abundance/runoff): Very Slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 20%		
Cover bare ground: 70%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: 30-70%	**Crown cover:** 30-70%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Acacia acuminata*	*Eremophila punicea*

ALL TAXA
Abutilon cryptopetalum
Acacia acuminata
Acacia grasbyi
Acacia incurvaneura
Acacia craspedocarpa
Acacia ramulosa var *ramulosa*
Acacia tetragonophylla
Amyema fitzgeraldii
Asteraceae seedlings
Atriplex bunburyana
Enchylaena tomentosa
Eremophila punicea
Eremophila clarkei
Euphorbia drummondii (A)
Lycium australe
Maireana pyramidata
Maireana triptera
Nicotiana rosulata (A)
Ptilotus obovatus
Rhagodia eremaea
Scaevola spinescens
Solanum lasiophyllum

Project Name: MMG		
Date: 27/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**572-574
Quadrat No: Q35	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 479m
Coordinates (GDA2020): 581695E; 6894719N		**Waypoint (NW Corner):** 301
Aspect: North East	**Fire (yrs):** Long unburnt	**Condition rating:** Good
Landform: Flat/ Plain		
Coarse fragments on the surface: Very; abundant (50-90%)/ Coarse gravelly; large pebbles (20-60mm)/ Subangular		
Rock outcrop (abundance/runoff): Very Slow		
Soil (profile/field texture/soil surface): Brown/ Sandy Clay loam/ Firm		
Cover leaf litter: 10%		
Cover bare ground: 80%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Chenopod Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 0.5-1m	**Height:** 0.25-0.5m
Crown cover: 10-30%	**Crown cover:** 10-30%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia pteraneura	*Maireana pyramidata*	*Maireana triptera*

ALL TAXA
Acacia pteraneura
Acacia incurvaneura
Aristida contorta (A)
Erodium cygnorum (A)
Hakea preissii
Lycium australe
Maireana pyramidata
Maireana triptera
Ptilotus obovatus

Project Name: MMG		
Date: 27/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**575-577
Quadrat No: Q36	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 475m
Coordinates (GDA2020): 581884E; 6893196N		**Waypoint (NW Corner):** 302
Aspect: East	**Fire (yrs):** Long unburnt	**Condition rating:** Good
Landform: Flat/ Plain		
Coarse fragments on the surface: Very; abundant (50-90%)/ Medium gravelly; medium pebbles (6-20mm)/ Subangular		
Rock outcrop (abundance/runoff): Very Slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 10%		
Cover bare ground: 85%		

Upper stratum	Mid-stratum	Lower stratum
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: <1%	**Crown cover:** <1%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Acacia ramulosa*	*Maireana pyramidata*

ALL TAXA
Acacia grasbyi
Acacia incurvaneura
Acacia ramulosa
Eremophila galeata
Erodium cygnorum
Chloris truncata
Maireana oppositifolia
Maireana pyramidata
Maireana triptera
Ptilotus obovatus
Scaevola spinescens
Solanum lasiophyllum
Tecticornia disarticulata

Project Name: MMG		
Date: 28/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**578-580
Quadrat No: Q37	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 608m
Coordinates (GDA2020): 581026E; 6899304N		**Waypoint (NW Corner):** 305
Aspect: East	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Upper slope; Midslope/ Hillslope		
Coarse fragments on the surface: Very; abundant (50-90%)/Cobbly; or cobbles (60-200mm)/ Subangular		
Rock outcrop (abundance/runoff): Rapid		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 10%		
Cover bare ground: 80%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** 30-70%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Thryptomene decussata*	*Ptilotus obovatus*

ALL TAXA
Acacia caesaneura
Acacia incurvaneura
Acacia aptaneura
Acacia quadrimarginea
Cheilanthes sieberi
Dodonaea rigida
Eremophila latrobei
Thryptomene decussata
Ptilotus obovatus
Ptilotus schwartzii
Sida spodochroma

Project Name: MMG		
Date: 28/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**581-583
Quadrat No: Q38	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 579m
Coordinates (GDA2020): 580822E; 68995367N		**Waypoint (NW Corner):** 306
Aspect: West	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Upper slope/ Hillslope		
Coarse fragments on the surface: Very; abundant (50-90%)/Cobbly; or cobbles (60-200mm)/ Subangular		
Rock outcrop (abundance/runoff): Rapid		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 15%		
Cover bare ground: 75%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.5-0.1m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Thryptomene decussata*	*Eremophila latrobei*

ALL TAXA
Acacia caesaneura
Acacia grasbyi
Acacia incurvaneura
Eremophila latrobei
Grevillea berryana
Thryptomene decussata
Ptilotus obovatus
Ptilotus schwartzii

Project Name: MMG		
Date: 28/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**587-589
Quadrat No: Q39	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 562m
Coordinates (GDA2020): 581134E; 6898768N		**Waypoint (NW Corner):** 307
Aspect: South	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Midslope/ Hillslope		
Coarse fragments on the surface: Very; abundant (50-90%)/Cobbly; or cobbles (60-200mm)/ Subangular		
Rock outcrop (abundance/runoff):		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 15%		
Cover bare ground: 75%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 3-6m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Thryptomene decussata*	*Eremophila latrobei*

ALL TAXA
Acacia caesaneura
Acacia incurvaneura
Acacia pteraneura
Acacia quadrimarginea
Eremophila latrobei
Grevillea berryana
Thryptomene decussata
Philotheca brucei

Project Name: MMG		
Date: 28/05/2024	**Botanist:** JJ + AJ	**Photo number (NW corner):**590-592
Quadrat No: Q40	**Quadrat size/shape:** 50m x 50m/ Square	**Elevation (m):** 504m
Coordinates (GDA2020): 583546E; 6897167N		**Waypoint (NW Corner):** 308
Aspect: East	**Fire (yrs):** Long unburnt	**Condition rating:** Very Good
Landform: Flat/ Plain		
Coarse fragments on the surface: Very; abundant (50-90%)/ Coarse gravelly; large pebbles (20-60mm)/ Subangular		
Rock outcrop (abundance/runoff): Very slow		
Soil (profile/field texture/soil surface): Brown/ Clay loam/ Firm		
Cover leaf litter: 15%		
Cover bare ground: 75%		

Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 1-3m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: <10%	**Crown cover:** 30-70%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia incurvaneura	*Senna* sp. Meekatharra	*Maireana pyramidata*

ALL TAXA
Acacia tetragonophylla
Atriplex bunburyana
Cenchrus ciliaris (W)
Eremophila galeata
Eremophila pantonii
Eremophila punicea
Euphorbia drummondii (A)
Maireana oppositifolia
Maireana pyramidata
Malvaceae seedlings
Sclerolaena cuneata
Sclerolaena diacantha
Senna sp. Meekatharra
Sida calyxhymenia
Tecticornia disarticulata

APPENDIX G:
QUADRAT PHOTOS

Quadrat 1			
Direction	**East**	**South-East**	**South**
Quadrat 2			
Direction	**East**	**South-East**	**South**
Quadrat 3			
Direction	**East**	**South-East**	**South**

Quadrat 4			
Direction	**East**	**South-East**	**South**
Quadrat 5			
Direction	**East**	**South-East**	**South**
Quadrat 6			
Direction	**East**	**South-East**	**South**

Quadrat 7			
Direction	**East**	**South-East**	**South**
Quadrat 8			
Direction	**East**	**South-East**	**South**
Quadrat 9			
Direction	**East**	**South-East**	**South**

Quadrat 10			
Direction	**East**	**South-East**	**South**
Quadrat 11			
Direction	**East**	**South-East**	**South**
Quadrat 12			
Direction	**East**	**South-East**	**South**

Quadrat 13			
Direction	**East**	**South-East**	**South**
Quadrat 14			
Direction	**East**	**South-East**	**South**
Quadrat 15			
Direction	**East**	**South-East**	**South**

Quadrat 16			
Direction	**East**	**South-East**	**South**
Quadrat 17			
Direction	**East**	**South-East**	**South**
Quadrat 18			
Direction	**East**	**South-East**	**South**

Quadrat 19			
Direction	**East**	**South-East**	**South**
Quadrat 20			
Direction	**East**	**South-East**	**South**
Quadrat 21			
Direction	**East**	**South-East**	**South**

Quadrat 22			
Direction	**East**	**South-East**	**South**
Quadrat 23			
Direction	**East**	**South-East**	**South**
Quadrat 24			
Direction	**East**	**South-East**	**South**

Quadrat 25			
Direction	**East**	**South-East**	**South**
Quadrat 26			
Direction	**East**	**South-East**	**South**
Quadrat 27			
Direction	**East**	**South-East**	**South**

Quadrat 28			
Direction	**East**	**South-East**	**South**
Quadrat 29			
Direction	**East**	**South-East**	**South**
Quadrat 30			
Direction	**East**	**South-East**	**South**

Quadrat 31			
Direction	**East**	**South-East**	**South**
Quadrat 32			
Direction	**East**	**South-East**	**South**
Quadrat 33			
Direction	**East**	**South-East**	**South**

Quadrat 34			
Direction	**East**	**South-East**	**South**
Quadrat 35			
Direction	**East**	**South-East**	**South**
Quadrat 36			
Direction	**East**	**South-East**	**South**

Quadrat 37			
Direction	**East**	**South-East**	**South**
Quadrat 38			
Direction	**East**	**South-East**	**South**
Quadrat 39			
Direction	**East**	**South-East**	**South**

Quadrat 40			
Direction	**East**	**South-East**	**South**

APPENDIX H:
DANDJOO DESKTOP SEARCH (40KM)

FLORA
Accepted name:
Abutilon cryptopetalum (F.Muell.) Benth.
Abutilon otocarpum F.Muell.
Abutilon oxycarpum subsp. Prostrate (A.A. Mitchell PRP 1266)
Acacia acanthoclada subsp. glaucescens Maslin
Acacia acuaria W.Fitzg.
Acacia aneura Benth.
Acacia anthochaera Maslin
Acacia aptaneura Maslin & J.E.Reid
Acacia aulacophylla R.S.Cowan & Maslin
Acacia ayersiana Maconochie
Acacia burkittii Benth.
Acacia burrowsiana Maslin
Acacia caesaneura Maslin & J.E.Reid
Acacia cockertoniana Maslin
Acacia craspedocarpa F.Muell.
Acacia cyperophylla Benth.
Acacia effusifolia Maslin & Buscumb
Acacia eremaea C.R.P.Andrews
Acacia exocarpoides W.Fitzg.
Acacia fuscaneura Maslin & J.E.Reid
Acacia grasbyi Maiden
Acacia heteroneura var. prolixa R.S.Cowan & Maslin
Acacia incurvaneura Maslin & J.E.Reid
Acacia jamesiana Maslin
Acacia kalgoorliensis R.S.Cowan & Maslin
Acacia lapidosa Maslin
Acacia latior (R.S.Cowan & Maslin) Maslin & Buscumb
Acacia macraneura Maslin & J.E.Reid
Acacia masliniana R.S.Cowan
Acacia microcalyx Maslin
Acacia mulganeura Maslin & J.E.Reid
Acacia murrayana Benth.
Acacia pruinocarpa Tindale
Acacia pteraneura Maslin & J.E.Reid
Acacia ramulosa var. linophylla (W.Fitzg.) Pedley
Acacia ramulosa W.Fitzg.
Acacia ramulosa W.Fitzg. var. ramulosa
Acacia rhodophloia Maslin
Acacia sclerosperma F.Muell.
Acacia sclerosperma F.Muell. subsp. sclerosperma
Acacia speckii R.S.Cowan & Maslin
Acacia stereophylla Meisn. var. stereophylla
Acacia subsessilis A.R.Chapm. & Maslin
Acacia tetragonophylla F.Muell.
Acacia tysonii Luehm.
Acacia umbraculiformis Maslin & Buscumb
Actinobole oldfieldianum P.S.Short
Actinobole uliginosum (A.Gray) H.Eichler
Althenia australis (Harv.) F.Muell.
Aluta aspera subsp. hesperia Rye & Trudgen
Alyogyne pinoniana (Gaudich.) Fryxell
Alyogyne pinoniana (Gaudich.) Fryxell var. pinoniana
Alyxia tetanifolia Cranfield
Amphipogon caricinus F.Muell.
Amyema gibberula (Tate) Danser var. gibberula
Amyema hilliana (Blakely) Danser
Amyema miquelii (Miq.) Tiegh.
Amyema nestor (S.Moore) Danser
Androcalva luteiflora (E.Pritz.) C.F.Wilkins & Whitlock
Angianthus microcephalus (F.Muell.) Benth.
Angianthus uniflorus P.S.Short
Aristida contorta F.Muell.
Aristida ingrata Domin
Aristida obscura Henrard
Arthropodium dyeri (Domin) Brittan
Asphodelus fistulosus L.
Asplenium subglandulosum (Hook. & Grev.) Salvo, Prada & T.E.DÃaz
Asteridea athrixioides (Sond. & F.Muell.) Kroner
Asteridea chaetopoda (F.Muell.) Kroner
Atriplex codonocarpa Paul G.Wilson
Atriplex nana Parr-Sm.
Atriplex semilunaris Aellen
Atriplex spongiosa F.Muell.
Atriplex vesicaria Benth.
Austrostipa variabilis (Hughes) S.W.L.Jacobs & J.Everett
Avena fatua L.
Baeckea elderiana E.Pritz.
Baeckea sp. London Bridge (M.E. Trudgen 5393)
Bergia perennis subsp. exigua G.J.Leach
Borya constricta Churchill
Brachychiton gregorii F.Muell.
Brachyscome ciliaris (Labill.) Less.
Brachyscome iberidifolia Benth.
Brachyscome perpusilla (Steetz) J.M.Black
Brunonia australis R.Br.
Bryum argenteum Hedw.

Bulbostylis barbata (Rottb.) C.B.Clarke
Bulbostylis turbinata S.T.Blake
Calandrinia calyptrata Hook.f.
Calandrinia creethae Morrison
Calandrinia crispisepala Obbens
Calandrinia eremaea Ewart
Calandrinia holtumii Obbens & L.P.Hancock
Calandrinia Kunth
Calandrinia lehmannii Endl.
Calandrinia papillata Syeda
Calandrinia polyandra Benth.
Calandrinia primuliflora Diels
Calandrinia ptychosperma F.Muell.
Calandrinia pumila (Benth.) F.Muell.
Calandrinia remota J.M.Black
Callistemon phoeniceus Lindl.
Callitris columellaris F.Muell.
Calocephalus multiflorus (Turcz.) Benth.
Calocephalus platycephalus (F.Muell.) Benth.
Calothamnus gilesii F.Muell.
Calotis hispidula (F.Muell.) F.Muell.
Calotis multicaulis (Turcz.) Druce
Calytrix amethystina Craven
Calytrix desolata S.Moore
Calytrix erosipetala Craven
Campylopus introflexus (Hedw.) Brid.
Centrolepis cephaloformis Reader
Centrolepis drummondiana (Nees) Walp.
Centrolepis strigosa subsp. rupestris D.A.Cooke
Cephalipterum drummondii A.Gray
Chamelaucium gracile F.Muell.
Cheilanthes adiantoides T.C.Chambers & P.A.Farrant
Cheilanthes brownii (Kuhn) Domin
Cheilanthes lasiophylla Pic.Serm.
Cheilanthes sieberi Kunze subsp. sieberi
Cheilanthes tenuifolia (Burm.f.) Sw.
Chenopodium curvispicatum Paul G.Wilson
Chenopodium gaudichaudianum (Moq.) Paul G.Wilson
Chondropyxis halophila D.A.Cooke
Chrysocephalum puteale (S.Moore) Paul G.Wilson
Chthonocephalus pseudevax Steetz
Chthonocephalus viscosus P.S.Short
Clitoria ternatea L.
Codonocarpus cotinifolius (Desf.) F.Muell.
Comesperma integerrimum Endl.
Convolvulus clementii Domin
Cotula cotuloides (Steetz) Druce
Craspedia haplorrhiza J.Everett & Doust
Crossidium davidai Catches.

Cuscuta epithymum (L.) L.
Cyanicula fragrans Hopper & A.P.Br.
Cymbopogon ambiguus (Hack.) A.Camus
Cynodon prostratus (C.A.Gardner & C.E.Hubb.) P.M.Peterson
Cyperus alterniflorus R.Br.
Cyperus iria L.
Cyperus rigidellus (Benth.) J.M.Black
Cyperus squarrosus L.
Dampiera dentata Rajput
Darwinia capitellata Rye
Daucus glochidiatus (Labill.) Fisch., C.A.Mey. & Ave-Lall.
Dichanthium sericeum subsp. humilius (J.M.Black) B.K.Simon
Dichanthium sericeum subsp. sericeum (R.Br.) A.Camus
Dicrastylis fulva Harv.
Dicrastylis linearifolia Munir
Dielitzia tysonii P.S.Short
Digitaria brownii (Roem. & Schult.) Hughes
Diplachne fusca subsp. muelleri (Benth.) P.M.Peterson & N.Snow
Diplotaxis muralis (L.) DC.
Dodonaea amplisemina K.A.Sheph. & Rye
Dodonaea inaequifolia Turcz.
Dodonaea petiolaris F.Muell.
Dodonaea rigida J.G.West
Dodonaea viscosa subsp. mucronata J.G.West
Dodonaea viscosa subsp. spatulata (Sm.) J.G.West
Drakaea elastica Lindl.
Drosera eremaea (N.G.Marchant & Lowrie) Lowrie & Conran
Duperreya commixta (Staples) Staples
Duperreya sericea Gaudich.
Dysphania glandulosa Paul G.Wilson
Dysphania glomulifera subsp. eremaea Paul G.Wilson
Dysphania kalpari Paul G.Wilson
Dysphania melanocarpa (J.M.Black) Mosyakin & Clemants
Dysphania melanocarpa (J.M.Black) Mosyakin & Clemants forma melanocarpa
Dysphania saxatilis (Paul G.Wilson) Mosyakin & Clemants
Eccremidium arcuatum (Hook.f. & Wilson) MÃ¼ll.Hal.
Eccremidium pulchellum (Hook.f. & Wilson) MÃ¼ll.Hal.
Enchylaena tomentosa R.Br. var. tomentosa
Enneapogon caerulescens (Gaudich.) N.T.Burb.
Eragrostis dielsii Pilg.
Eragrostis eriopoda Benth.
Eragrostis falcata (Gaudich.) Steud.
Eragrostis lanipes C.E.Hubb.
Eragrostis leptocarpa Benth.
Eragrostis pergracilis S.T.Blake
Eragrostis setifolia Nees

Eragrostis sp. Lake Carey (J. Paterson & J. Warden WB 40825)
Eragrostis sp. Yeelirrie Calcrete (S. Regan LCH 26770)
Eremophila alternifolia R.Br.
Eremophila clarkei A.F.Oldfield & F.Muell.
Eremophila compacta S.Moore subsp. compacta
Eremophila deserti (Benth.) Chinnock
Eremophila eriocalyx F.Muell.
Eremophila exilifolia F.Muell.
Eremophila foliosissima Kraenzl.
Eremophila forrestii F.Muell.
Eremophila forrestii F.Muell. subsp. forrestii
Eremophila fraseri F.Muell. subsp. fraseri
Eremophila fraseri subsp. parva Chinnock
Eremophila galeata Chinnock
Eremophila georgei Diels
Eremophila gilesii F.Muell. subsp. gilesii
Eremophila glabra (R.Br.) Ostenf.
Eremophila glabra (R.Br.) Ostenf. subsp. glabra
Eremophila glabra subsp. albicans (Bartl.) Chinnock
Eremophila glandulifera Chinnock
Eremophila glutinosa Chinnock
Eremophila granitica S.Moore
Eremophila hygrophana Chinnock
Eremophila jucunda Chinnock subsp. jucunda
Eremophila lachnocalyx C.A.Gardner
Eremophila latrobei F.Muell. subsp. latrobei
Eremophila latrobei subsp. glabra (L.S.Sm.) Chinnock
Eremophila longifolia (R.Br.) F.Muell.
Eremophila mackinlayi F.Muell.
Eremophila mackinlayi subsp. spathulata Chinnock
Eremophila macmillaniana C.A.Gardner
Eremophila maculata subsp. brevifolia (Benth.) Chinnock
Eremophila miniata C.A.Gardner
Eremophila oldfieldii subsp. angustifolia (S.Moore) Chinnock
Eremophila oppositifolia subsp. angustifolia (S.Moore) Chinnock
Eremophila pantonii F.Muell.
Eremophila platycalyx F.Muell. subsp. platycalyx
Eremophila platycalyx subsp. Granites (D.J. Edinger & G. Marsh DJE 4782)
Eremophila platycalyx subsp. platycalyx F.Muell.
Eremophila punicea S.Moore
Eremophila rostrata Chinnock subsp. rostrata
Eremophila serrulata (A.DC.) Druce
Eremophila simulans Chinnock subsp. simulans
Eremophila spectabilis subsp. spectabilis C.A.Gardner
Eremophila spuria Chinnock
Eremophila viscida Endl.
Eremophila youngii F.Muell. subsp. youngii
Eriachne ovata Nees

Eriachne pulchella Domin
Eriachne pulchella Domin subsp. pulchella
Eriochloa pseudoacrotricha (Thell.) J.M.Black
Erodium crinitum Carolin
Erodium cygnorum Nees
Erymophyllum glossanthus Paul G.Wilson
Erymophyllum ramosum (A.Gray) Paul G.Wilson
Erymophyllum ramosum (A.Gray) Paul G.Wilson subsp. ramosum
Eucalyptus clelandiorum (Maiden) Maiden
Eucalyptus ewartiana Maiden
Eucalyptus gongylocarpa Blakely
Eucalyptus horistes L.A.S.Johnson & K.D.Hill
Eucalyptus kingsmillii (Maiden) Maiden & Blakely
Eucalyptus kochii subsp. amaryssia D.Nicolle
Eucalyptus kochii subsp. plenissima (C.A.Gardner) Brooker
Eucalyptus lesouefii Maiden
Eucalyptus lucasii Blakely
Eucalyptus striaticalyx W.Fitzg.
Euphorbia porcata Halford & W.K.Harris
Euryomyrtus recurva Trudgen
Exocarpos aphyllus R.Br.
Feldstonia nitens P.S.Short
Frankenia cinerea A.DC.
Frankenia laxiflora Summerh.
Frankenia sessilis Summerh.
Frankenia setosa W.Fitzg.
Gilruthia osbornei Ewart & Jean White
Glossostigma diandrum (L.) Kuntze
Glycine canescens F.J.Herm.
Glycine clandestina Willd.
Glycine tomentella Hayata
Gnephosis angianthoides (Steetz) Anderb.
Gnephosis arachnoidea Turcz.
Gnephosis brevifolia (A.Gray) Benth.
Gnephosis macrocephala Turcz.
Gnephosis trifida (P.S.Short) P.S.Short
Gomphrena verecunda R.W.Davis
Gonocarpus nodulosus Nees
Goodenia collaris (F.Muell.) K.A.Sheph.
Goodenia glabrata (Carolin) K.A.Sheph.
Goodenia kingiana Carolin
Goodenia macroplectra (F.Muell.) Carolin
Goodenia mimuloides S.Moore
Goodenia neogoodenia Carolin
Goodenia occidentalis Carolin
Goodenia pinnatifida Schltdl.
Goodenia rosea (S.Moore) K.A.Sheph.
Goodenia sp. Midwest (K.A. Shepherd & C.F. Wilkins KS 1609)

Grevillea acuaria Benth.
Grevillea berryana Ewart & Jean White
Grevillea deflexa F.Muell.
Grevillea eriostachya Lindl.
Grevillea extorris S.Moore
Grevillea hakeoides subsp. stenophylla (W.Fitzg.) McGill.
Grevillea inconspicua Diels
Grevillea nematophylla subsp. supraplana Makinson
Grevillea obliquistigma C.A.Gardner subsp. obliquistigma
Grevillea pityophylla F.Muell.
Grevillea sarissa subsp. bicolor McGill.
Grimmia laevigata (Brid.) Brid.
Gunniopsis quadrifida (F.Muell.) Pax
Gymnema graniticola (P.I.Forst.) P.I.Forst.
Hakea preissii Meisn.
Hakea recurva Meisn.
Hakea recurva Meisn. subsp. recurva
Hakea recurva subsp. arida (Diels) W.R.Barker & R.M.Barker
Halgania anagalloides Endl.
Haloragis trigonocarpa F.Muell.
Helipterum craspedioides W.Fitzg.
Hemigenia benthamii G.R.Guerin
Hemigenia macphersonii Luehm.
Hemigenia sp. Yalgoo (A.M. Ashby 2624)
Hibiscus sp. Gardneri (A.L. Payne PRP 1435)
Homalocalyx inerrabundus Craven
Homalocalyx thryptomenoides (F.Muell.) Craven
Hyalosperma glutinosum Steetz subsp. glutinosum
Hyalosperma glutinosum subsp. venustum (S.Moore) Paul G.Wilson
Hydrocotyle diantha DC.
Hypochaeris glabra L.
Indigofera kingiana Peter G.Wilson & Rowe
Isoetes australis S.Williams
Isoetes caroli E.R.L.Johnson
Isoetopsis graminifolia Turcz.
Isolepis congrua Nees
Jacksonia lanicarpa Chappill
Kippistia suaedifolia F.Muell.
Lachnagrostis filiformis (G.Forst.) Trin.
Lachnostachys verbascifolia F.Muell. var. verbascifolia
Lawrencella davenportii (F.Muell.) Paul G.Wilson
Lawrencella rosea Lindl.
Lawrencia glomerata Hook.
Lawrencia helmsii (F.Muell. & Tate) Lander
Lemooria burkittii (Benth.) P.S.Short
Lemphoria andraeana (F.Muell.) Al-Shehbaz & Lysak
Lepidium oxytrichum Sprague
Lepidium phlebopetalum (F.Muell.) F.Muell.

Lepidium platypetalum Hewson
Leucopogon sp. Clyde Hill (M.A. Burgman 1207)
Levenhookia dubia Sond.
Levenhookia leptantha Benth.
Lithotoma petraea (F.Muell.) E.B.Knox
Lobelia simulans N.G.Walsh
Lobelia winfridae Diels
Lotus cruentus Court
Lycium australe F.Muell.
Lysiana casuarinae (Miq.) Tiegh.
Lysiana murrayi (F.Muell. & Tate) Tiegh.
Maireana amoena (Diels) Paul G.Wilson
Maireana appressa (Benth.) Paul G.Wilson
Maireana atkinsiana (W.Fitzg.) Paul G.Wilson
Maireana carnosa (Moq.) Paul G.Wilson
Maireana convexa Paul G.Wilson
Maireana georgei (Diels) Paul G.Wilson
Maireana lobiflora (Benth.) Paul G.Wilson
Maireana pentatropis (Tate) Paul G.Wilson
Maireana pyramidata (Benth.) Paul G.Wilson
Maireana suaedifolia (Paul G.Wilson) Paul G.Wilson
Maireana thesioides (C.A.Gardner) Paul G.Wilson
Maireana tomentosa Moq.
Maireana trichoptera (J.M.Black) Paul G.Wilson
Maireana triptera (Benth.) Paul G.Wilson
Maireana villosa (Lindl.) Paul G.Wilson
Medicago minima (L.) Bartal.
Medicago polymorpha L.
Melaleuca glomerata F.Muell.
Melaleuca leiocarpa F.Muell.
Melaleuca stereophloia Craven
Menkea villosula (F.Muell. & Tate) J.M.Black
Micromyrtus flaviflora (F.Muell.) J.M.Black
Micromyrtus sulphurea W.Fitzg.
Microtis eremaea R.J.Bates
Millotia depauperata Stapf
Millotia myosotidifolia (Benth.) Steetz
Minuria cunninghamii (DC.) Benth.
Minuria gardneri Lander & R.Barry
Minuria leptophylla DC.
Minuria tridens (D.A.Cooke) Lander
Mirbelia depressa E.Pritz.
Mirbelia rhagodioides Crisp & J.M.Taylor
Mirbelia sp. Bursarioides (T.R. Lally 760)
Monachather paradoxus Steud.
Muelleranthus parvalatus I.Thomps.
Muelleranthus trifoliolatus (F.Muell.) A.T.Lee
Myoporum montanum R.Br.
Myriocephalus appendiculatus Benth.

Myriocephalus gascoynensis P.S.Short
Myriocephalus gueriniae F.Muell.
Myriocephalus nudus A.Gray
Myriocephalus oldfieldii (F.Muell.) Paul G.Wilson
Myriocephalus pygmaeus (A.Gray) P.S.Short
Myriocephalus rudallii Benth.
Nicotiana cavicola N.T.Burb.
Nicotiana obliqua (N.T.Burb.) M.W.Chase & Christenh.
Nicotiana rosulata (S.Moore) Domin
Olearia humilis Lander
Olearia pimeleoides (DC.) Benth.
Olearia stuartii (F.Muell.) Benth.
Ophioglossum lusitanicum L.
Opuntia elatior Mill.
Panaetia lessonii Cass.
Peplidium muelleri Benth.
Peplidium sp. C Evol. Fl. Fauna Arid Aust. (N.T. Burbidge & A. Kanis 8158)
Persoonia stricta P.H.Weston
Petrophile pauciflora Foreman
Petrophile vana Cranfield & T.Macfarlane
Phaeoceros tuberosus (Taylor) Prosk.
Philotheca brucei (F.Muell.) Paul G.Wilson subsp. brucei
Philotheca brucei subsp. brevifolia (Paul G.Wilson) Paul G.Wilson
Philotheca nutans (Paul G.Wilson) Paul G.Wilson
Philotheca sericea (Paul G.Wilson) Paul G.Wilson
Pileanthus rubrinitidus Keighery
Pimelea forrestiana F.Muell.
Pimelea microcephala R.Br. subsp. microcephala
Pittosporum angustifolium Lodd., G.Lodd. & W.Lodd.
Plagiochasma rupestre (J.R.Forst. & G.Forst.) Steph.
Plantago drummondii Decne.
Plantago sp. Mt Magnet (A.S. George 6793)
Pleuridium nervosum (Hook.) Mitt.
Pluchea rubelliflora (F.Muell.) B.L.Rob.
Podolepis aristata subsp. affinis (Sond.) Jeanes
Pogonolepis stricta Steetz
Prasophyllum gracile Lindl.
Prasophyllum macrostachyum R.Br.
Prostanthera althoferi B.J.Conn subsp. althoferi
Prostanthera campbellii F.Muell.
Prostanthera patens B.J.Conn
Prostanthera striatiflora F.Muell.
Pseudognaphalium luteoalbum (L.) Hilliard & B.L.Burtt
Psydrax suaveolens (S.Moore) S.T.Reynolds & R.J.F.Hend.
Pterostylis setulosa (D.L.Jones & C.J.French) D.L.Jones & C.J.French
Ptilotus aervoides (F.Muell.) F.Muell.
Ptilotus chamaecladus Diels
Ptilotus divaricatus (Gaudich.) F.Muell.

Ptilotus drummondii (Moq.) F.Muell.
Ptilotus drummondii var. minor (Nees) Benl
Ptilotus gaudichaudii (Steud.) J.M.Black
Ptilotus helipteroides (F.Muell.) F.Muell.
Ptilotus luteolus (Benl & H.Eichler) R.W.Davis
Ptilotus nobilis (Lindl.) F.Muell.
Ptilotus obovatus (Gaudich.) F.Muell.
Ptilotus polakii F.Muell.
Ptilotus polakii F.Muell. subsp. polakii
Ptilotus polystachyus (Gaudich.) F.Muell.
Ptilotus rotundifolius (F.Muell.) F.Muell.
Ptilotus schwartzii (F.Muell.) Tate
Ptilotus schwartzii Tate var. schwartzii
Ptilotus sericostachyus (Nees) F.Muell.
Quinqueremulus linearis Paul G.Wilson
Ranunculus pentandrus var. platycarpus (F.Muell.) H.Eichler
Rhagodia drummondii Moq.
Rhagodia eremaea Paul G.Wilson
Rhodanthe battii (F.Muell.) Paul G.Wilson
Rhodanthe charsleyae (F.Muell.) Paul G.Wilson
Rhodanthe chlorocephala subsp. splendida (Hemsl.) Paul G.Wilson
Rhodanthe citrina (Benth.) Paul G.Wilson
Rhodanthe floribunda (DC.) Paul G.Wilson
Rhodanthe humboldtiana (Gaudich.) Paul G.Wilson
Rhodanthe maryonii (S.Moore) Paul G.Wilson
Rhodanthe polakii (F.Muell.) Paul G.Wilson
Rhodanthe propinqua (W.Fitzg.) Paul G.Wilson
Rhodanthe spicata (Steetz) Paul G.Wilson
Rhodanthe sterilescens (F.Muell.) Paul G.Wilson
Rhodanthe stricta (Lindl.) Paul G.Wilson
Riccia bifurca Hoffm.
Riccia crinita Taylor
Riccia lamellosa Raddi
Riccia limbata Bisch. ex C.Krauss
Roebuckiella cheilocarpa var. glabrata (P.S.Short) P.S.Short
Roebuckiella ciliocarpa (W.Fitzg.) P.S.Short
Roepera aurantiaca Lindl.
Roepera compressa (J.M.Black) Beier & Thulin
Roepera fruticulosa (DC.) G.Don
Roepera ovata (Ewart & Jean White) Beier & Thulin
Rostraria pumila (Desf.) Tzvelev
Rosulabryum campylothecium (Taylor) J.R.Spence
Rosulabryum capillare (Hedw.) J.R.Spence
Salsola australis R.Br.
Santalum lanceolatum R.Br.
Santalum spicatum (R.Br.) A.DC.
Scaevola parvifolia subsp. acuminata Carolin
Scaevola spinescens R.Br.

Scaevola tomentosa Gaudich.
Schismus barbatus (L.) Thell.
Schoenia ayersii (F.Muell.) J.M.Black
Schoenia cassiniana (Gaudich.) Steetz
Schoenoplectiella dissachantha (S.T.Blake) Lye
Schoenus humilis Benth.
Schoenus subaphyllus KÃ¼k.
Sclerolaena alata Paul G.Wilson
Sclerolaena burbidgeae (Ising) A.J.Scott
Sclerolaena densiflora (W.Fitzg.) A.J.Scott
Sclerolaena divaricata (R.Br.) Domin
Sclerolaena eriacantha (F.Muell.) Ulbr.
Sclerolaena eurotioides (F.Muell.) A.J.Scott
Sclerolaena fimbriolata (F.Muell.) A.J.Scott
Sclerolaena patenticuspis (R.H.Anderson) Ulbr.
Senecio glossanthus (Sond.) Belcher
Senecio lacustrinus I.Thomps.
Senecio minimus Poir.
Senna artemisioides subsp. filifolia Randell
Senna artemisioides subsp. x petiolaris Randell
Senna artemisioides subsp. x sturtii (R.Br.) Randell
Senna charlesiana (Symon) Randell
Senna glutinosa (DC.) Randell subsp. glutinosa
Senna glutinosa subsp. chatelainiana (Gaudich.) Randell
Seringia exastia (C.F.Wilkins) C.F.Wilkins & Whitlock
Seringia velutina (Steetz) F.Muell.
Setaria dielsii R.A.W.Herrm.
Sida calyxhymenia DC.
Sida ectogama W.R.Barker & R.M.Barker
Sida sp. dark green fruits (S. van Leeuwen 2260)
Sida sp. Golden calyces glabrous (H.N. Foote 32)
Siemssenia capillaris Steetz
Siloxerus multiflorus Nees
Solanum cleistogamum Symon
Solanum ferocissimum Lindl.
Solanum lasiophyllum Poir.
Solanum nigrum L.
Solanum nummularium S.Moore
Solanum orbiculatum Poir. subsp. orbiculatum
Sonchus oleraceus L.
Sondottia connata (W.Fitzg.) P.S.Short
Sondottia glabrata P.S.Short
Spergularia bocconei (Scheele) Graebn.
Stachystemon intricatus Halford & R.J.F.Hend.
Stemodia florulenta W.R.Barker
Stenanthemum mediale Rye
Stenopetalum anfractum E.A.Shaw
Stenopetalum filifolium Benth.
Stenopetalum nutans F.Muell.
Stenopetalum sphaerocarpum F.Muell.
Streptoglossa cylindriceps (J.M.Black) Dunlop
Streptoglossa liatroides (Turcz.) Dunlop
Stylidium longibracteatum Carlquist
Stylidium sp. Mt Bayly (J.A. Wege & C. Wilkins JAW 1986)
Stylidium warriedarense Lowrie, A.H.Burb. & Kenneally
Swainsona affinis (A.T.Lee) Joy Thomps.
Swainsona beasleyana F.Muell.
Swainsona elegans A.T.Lee
Swainsona elegantoides (A.T.Lee) Joy Thomps.
Swainsona gracilis Benth.
Swainsona kingii F.Muell.
Swainsona paradoxa W.Fitzg.
Swainsona paucifoliolata Joy Thomps.
Swainsona purpurea (A.T.Lee) Joy Thomps.
Swainsona rostellata A.T.Lee
Swainsona unifoliolata F.Muell.
Synaptantha tillaeacea (F.Muell.) Hook.f. var. tillaeacea
Tecticornia calyptrata (Paul G.Wilson) K.A.Sheph. & Paul G.Wilson
Tecticornia fimbriata (Paul G.Wilson) K.A.Sheph. & Paul G.Wilson
Tecticornia halocnemoides (Nees) K.A.Sheph. & Paul G.Wilson
Tecticornia indica subsp. leiostachya (Benth.) K.A.Sheph. & Paul G.Wilson
Tecticornia laevigata K.A.Sheph.
Tecticornia peltata (Paul G.Wilson) K.A.Sheph. & Paul G.Wilson
Tecticornia pruinosa (Paulsen) K.A.Sheph. & Paul G.Wilson
Tecticornia sp. Burnerbinmah (D. Edinger et al. 101)
Tecticornia sp. Dennys Crossing (K.A. Shepherd & J. English KS 552)
Tecticornia undulata (Paul G.Wilson) K.A.Sheph. & Paul G.Wilson
Tetragonia cristata A.M.Prescott
Tetragonia moorei M.Gray
Teucrium teucriiflorum (F.Muell.) Kattari & Salmaki
Thryptomene costata Rye & Trudgen
Thryptomene decussata (W.Fitzg.) J.W.Green
Thryptomene mucronulata Turcz.
Thyridia repens (R.Br.) W.R.Barker & Beardsley
Thyridolepis mitchelliana (Nees) S.T.Blake
Thysanotus manglesianus Kunth
Thysanotus pyramidalis Brittan
Thysanotus speckii Brittan
Trachymene cyanopetala (F.Muell.) Benth.
Trachymene ornata (Endl.) Druce
Tragus australianus S.T.Blake
Trianthema triquetrum Willd.
Tribulus adelacanthus R.M.Barker
Tribulus astrocarpus F.Muell.
Tribulus terrestris L.

Trichanthodium exilis (W.Fitzg.) P.S.Short
Trichanthodium skirrophorum Sond.
Triglochin mucronata R.Br.
Triglochin sp. A Flora of Australia (G.J. Keighery 2477)
Trigonella suavissima Lindl.
Triodia rigidissima (Pilg.) Lazarides
Triptilodiscus pygmaeus Turcz.
Verticordia interioris A.S.George

Vincetoxicum lineare (Decne.) Meve & Liede
Vulpia bromoides (L.) Gray
Waitzia acuminata Steetz var. acuminata
Walshia kendallii (F.Muell.) Jeanes
Wurmbea densiflora (Benth.) T.Macfarlane
Wurmbea deserticola T.Macfarlane
Wurmbea tenella (Endl.) Benth.

FAUNA: Accepted name:	Conservation code	Kingdom	Class
Neobatrachus kunapalari Mahony & Roberts, 1986		Animalia	Amphibia
Neobatrachus sudellae (Lamb, 1911)		Animalia	Amphibia
Neobatrachus sutor Main, 1957		Animalia	Amphibia
Pseudophryne occidentalis Parker, 1940		Animalia	Amphibia
Cyclorana maini Tyler & Martin, 1977		Animalia	Amphibia
Cyclorana occidentalis Anstis, Price, Roberts, Catalano, Hines, Doughty & Donnellan, 2016		Animalia	Amphibia
Litoria rubella Gray, 1842		Animalia	Amphibia
Anas castanea (Eyton, 1838)		Animalia	Aves
Dromaius novaehollandiae (Latham, 1790)		Animalia	Aves
Dromaius novaehollandiae novaehollandiae Latham, 1790		Animalia	Aves
Charadrius ruficapillus Temminck, 1822		Animalia	Aves
Elseyornis melanops (Vieillot, 1818)		Animalia	Aves
Erythrogonys cinctus Gould, 1838		Animalia	Aves
Ocyphaps lophotes (Temminck, 1822)		Animalia	Aves
Chalcites basalis (Horsfield, 1821)		Animalia	Aves
Falco cenchroides Vigors & Horsfield, 1827		Animalia	Aves
Falco hypoleucos Gould, 1841	VU	Animalia	Aves
Falco peregrinus Tunstall, 1771	OS	Animalia	Aves
Leipoa ocellata Gould, 1840	VU	Animalia	Aves
Tribonyx ventralis (Gould, 1837)		Animalia	Aves
Acanthiza apicalis Gould, 1847		Animalia	Aves
Acanthiza apicalis apicalis Gould, 1847		Animalia	Aves
Acanthiza robustirostris Milligan, 1903		Animalia	Aves
Acanthiza uropygialis Gould, 1838		Animalia	Aves
Aphelocephala leucopsis (Gould, 1841)		Animalia	Aves
Gerygone fusca (Gould, 1838)		Animalia	Aves
Pyrrholaemus brunneus Gould, 1841		Animalia	Aves
Artamus cinereus Vieillot, 1817		Animalia	Aves
Artamus minor Vieillot, 1817		Animalia	Aves
Cracticus nigrogularis (Gould, 1837)		Animalia	Aves
Cracticus torquatus (Latham, 1802)		Animalia	Aves
Gymnorhina tibicen (Latham, 1802)		Animalia	Aves
Coracina maxima (RÃ¼ppell, 1839)		Animalia	Aves
Coracina novaehollandiae (Gmelin, 1789)		Animalia	Aves
Cinclosoma castaneothorax Gould, 1848		Animalia	Aves
Psophodes cristatus (Gould, 1838)		Animalia	Aves
Climacteris affinis Blyth, 1864		Animalia	Aves
Corvus bennetti North, 1901		Animalia	Aves
Corvus coronoides coronoides Vigors & Horsfield, 1827		Animalia	Aves
Corvus orru cecilae Mathews, 1912		Animalia	Aves
Taeniopygia castanotis (Gould, 1837)		Animalia	Aves
Malurus lamberti Vigors & Horsfield, 1827	Parent of conservation listed taxa	Animalia	Aves
Malurus leucopterus Dumont, 1824		Animalia	Aves
Malurus leucopterus leuconotus Gould, 1865		Animalia	Aves

FAUNA: Accepted name:	Conservation code	Kingdom	Class
Malurus splendens (Quoy & Gaimard, 1830)		Animalia	Aves
Acanthagenys rufogularis Gould, 1838		Animalia	Aves
Certhionyx variegatus Lesson, 1830		Animalia	Aves
Gavicalis virescens (Vieillot, 1817)		Animalia	Aves
Lichmera indistincta (Vigors & Horsfield, 1827)		Animalia	Aves
Manorina flavigula (Gould, 1840)		Animalia	Aves
Purnella albifrons Gould, 1841		Animalia	Aves
Oreoica gutturalis (Vigors & Horsfield, 1827)		Animalia	Aves
Colluricincla harmonica (Latham, 1802)		Animalia	Aves
Colluricincla harmonica rufiventris Gould, 1841		Animalia	Aves
Pachycephala rufiventris (Latham, 1802)		Animalia	Aves
Melanodryas cucullata (Latham, 1802)		Animalia	Aves
Petroica goodenovii (Vigors & Horsfield, 1827)		Animalia	Aves
Pomatostomus superciliosus (Vigors & Horsfield, 1827)		Animalia	Aves
Pomatostomus temporalis (Vigors & Horsfield, 1827)		Animalia	Aves
Cincloramphus cruralis (Vigors & Horsfield, 1827)		Animalia	Aves
Barnardius zonarius (Shaw, 1805)		Animalia	Aves
Neopsephotus bourkii (Gould, 1841)		Animalia	Aves
Psephotellus varius (Clark & AH, 1910)		Animalia	Aves
Nyctophilus geoffroyi Leach, 1821		Animalia	Mammalia
Scotorepens balstoni (Thomas, 1906)		Animalia	Mammalia
Antechinomys laniger (Gould, 1856)		Animalia	Mammalia
Pseudantechinus woolleyae Kitchener & Caputi, 1988		Animalia	Mammalia
Sminthopsis crassicaudata (Gould, 1844)		Animalia	Mammalia
Sminthopsis dolichura Kitchener, Stoddart & Henry, 1984		Animalia	Mammalia
Notomys alexis Thomas, 1922		Animalia	Mammalia
Pseudomys hermannsburgensis (Waite, 1896)		Animalia	Mammalia
Amphibolurus longirostris (Boulenger, 1883)		Animalia	Reptilia
Ctenophorus caudicinctus (GÃ¼nther, 1875)		Animalia	Reptilia
Ctenophorus caudicinctus mensarum (Storr, 1967)		Animalia	Reptilia
Ctenophorus maculatus (Gray, 1831)		Animalia	Reptilia
Ctenophorus nuchalis (De Vis, 1884)		Animalia	Reptilia
Ctenophorus ornatus (Gray, 1875)		Animalia	Reptilia
Ctenophorus reticulatus (Gray, 1845)		Animalia	Reptilia
Ctenophorus scutulatus (Stirling & Zietz, 1893)		Animalia	Reptilia
Gowidon longirostris (Boulenger, 1883)		Animalia	Reptilia
Pogona minor minor (Sternfeld, 1919)		Animalia	Reptilia
Tympanocryptis pseudopsephos Doughty, Kealley, Shoo & Melville, 2015		Animalia	Reptilia
Diplodactylus granariensis rex Storr, 1988		Animalia	Reptilia
Diplodactylus pulcher Steindachner, 1870		Animalia	Reptilia
Lucasium squarrosum (Kluge, 1962)		Animalia	Reptilia
Oedura fimbria Oliver & Doughty, 2016		Animalia	Reptilia
Oedura marmorata Gray, 1842		Animalia	Reptilia
Rhynchoedura ornata GÃ¼nther, 1867		Animalia	Reptilia
Strophurus strophurus DumÃ©ril & Bibron, 1836		Animalia	Reptilia
Brachyurophis fasciolatus fasciolatus (GÃ¼nther, 1872)		Animalia	Reptilia
Pseudechis butleri Smith, 1982		Animalia	Reptilia
Pseudonaja mengdeni Wells & Wellington, 1985		Animalia	Reptilia
Pseudonaja modesta (GÃ¼nther, 1872)		Animalia	Reptilia
Pseudonaja nuchalis GÃ¼nther, 1858		Animalia	Reptilia
Simoselaps bertholdi (Jan, 1859)		Animalia	Reptilia
Suta fasciata Rosen, 1905		Animalia	Reptilia
Gehyra crypta Kealley, Doughty, Pepper, Keogh, Hillyer & Huey, 2018		Animalia	Reptilia
Gehyra polka Doughty, Bauer, Pepper, Keogh & Ellis, 2018		Animalia	Reptilia
Gehyra punctata (Fry, 1914)		Animalia	Reptilia
Gehyra variegata (DumÃ©ril & Bibron, 1836)		Animalia	Reptilia
Heteronotia binoei (Gray, 1845)		Animalia	Reptilia
Antaresia perthensis (Stull, 1932)		Animalia	Reptilia
Ctenotus schomburgkii (Peters, 1863)		Animalia	Reptilia

FAUNA: Accepted name:	Conservation code	Kingdom	Class
Ctenotus severus Storr, 1969		Animalia	Reptilia
Cyclodomorphus branchialis (GÃ¼nther, 1867)	VU	Animalia	Reptilia
Egernia depressa (GÃ¼nther, 1875)		Animalia	Reptilia
Egernia stokesii badia Storr, 1978	VU	Animalia	Reptilia
Eremiascincus richardsonii (Gray, 1845)		Animalia	Reptilia
Lerista gerrardii (Gray, 1864)		Animalia	Reptilia
Lerista nicholsi (Loveridge, 1933)		Animalia	Reptilia
Lerista timida (de Vis, 1888)		Animalia	Reptilia
Menetia greyii Gray, 1845		Animalia	Reptilia
Varanus caudolineatus Boulenger, 1885		Animalia	Reptilia
Varanus gouldii (Gray, 1838)		Animalia	Reptilia
Varanus panoptes Storr, 1980		Animalia	Reptilia
Varanus panoptes rubidus Storr, 1980		Animalia	Reptilia
Suta monachus (Storr, 1964)		Animalia	Reptilia

APPENDIX I:
EPBC PROTECTED MATTERS SEARCH (40KM BUFFER)

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 13-Jun-2024

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	10
Listed Migratory Species:	7

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	14
Commonwealth Heritage Places:	None
Listed Marine Species:	12
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	3
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	2
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Species			[Resource Information]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.			
Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In buffer area only
PLANT			
Minuria tridens Minnie Daisy [13753]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
REPTILE			
Egernia stokesii badia			
Western Spiny-tailed Skink, Baudin Island Spiny-tailed Skink [64483]	Endangered	Species or species habitat known to occur within area	In feature area
SPIDER			
Idiosoma nigrum			
Shield-backed Trapdoor Spider, Black Rugose Trapdoor Spider [66798]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In buffer area only
Migratory Terrestrial Species			
Motacilla cinerea			
Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

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

Commonwealth Land Name	State	Buffer Status
Unknown		
Commonwealth Land - [51633]	WA	In feature area
Commonwealth Land - [51632]	WA	In feature area
Commonwealth Land - [51637]	WA	In feature area
Commonwealth Land - [51636]	WA	In feature area
Commonwealth Land - [52151]	WA	In feature area
Commonwealth Land - [51944]	WA	In feature area
Commonwealth Land - [51943]	WA	In feature area
Commonwealth Land - [52150]	WA	In feature area
Commonwealth Land - [51941]	WA	In feature area
Commonwealth Land - [51942]	WA	In feature area
Commonwealth Land - [51639]	WA	In feature area
Commonwealth Land - [51638]	WA	In feature area
Commonwealth Land - [51634]	WA	In feature area
Commonwealth Land - [51635]	WA	In feature area

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In buffer area only
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In buffer area only
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Lakeside	Conservation Park	WA	In buffer area only
Lakeside	National Park	WA	In buffer area only
Lakeside Pastoral Lease	NRS Addition - Gazettal in Progress	WA	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Referral decision				
Northern Goldfields Interconnect Pipeline	2021/8900	Referral Decision	Referral Publication	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

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

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

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

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

Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601 Australia
+61 2 6274 1111