Lake Roe Project

Detailed Flora Survey

Prepared for AC Minerals Pty Ltd
June 2025

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Cover Photo: Woodland adjacent to Lake Roe in the survey area (Taken 30th April 2025).

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APPENDICES

1 EXECUTIVE SUMMARY

Botanica Consulting Pty Ltd (Botanica) was commissioned by AC Minerals Pty Ltd (AC Minerals), a wholly owned subsidiary of Ramelius Resources Ltd, to undertake a detailed flora and vegetation survey, of the proposed Lake Roe Project (referred to as the 'survey area'). The survey area is approximately 600 ha. It is located approximately 105 km east of Kalgoorlie-Boulder, in the City of Kalgoorlie-Boulder, Western Australia.

The survey area lies within the Eastern Goldfield (COO3) subregion of the Coolgardie Bioregion, as defined by the Interim Biogeographic Regionalisation of Australia (IBRA). The survey area is located within the Yindi pastoral station.

Botanica conducted a detailed flora and vegetation survey on the 12th to 13th March 2025, with a revisit to the site on the 30th April 2025 after heavy rainfall in March. The area was traversed using a four-wheel drive vehicle and on foot by three Botanica personnel.

Eight vegetation types were identified within the survey area. These vegetation types were identified within three landform types and comprised of six major vegetation groups. Ninety-six flora taxa, representing 45 genera was identified within the survey area. Nine annual species were present. No introduced flora was 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 mostly a result of previous and current exploration and grazing by large feral herbivores.

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. One Priority 1 flora species (*Calandrinia quartzitica)* was identified within the survey area. Two species of Tecticornia that were collected and sent to the WA Herbarium could not be identified and will need further survey. No Priority Ecological Communities were identified within the survey area.

There are no Reserves in the survey area, the nearest gazetted Reserve is Wallaby Rocks Timber Reserve (R1974) which is approximately 8.2 km south of the survey area. There are no wetlands of international importance (Ramsar Wetlands) or national importance (Australian Nature Conservation Agency Wetlands) 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).

2 INTRODUCTION

Botanica Consulting Pty Ltd (Botanica) was commissioned by AC Minerals Pty Ltd (AC Minerals) to undertake a detailed flora and vegetation survey, of the proposed Lake Roe Project (referred to as the 'survey area'). The survey area is approximately 600 ha. It is located approximately 105 km east of Kalgoorlie-Boulder, in the City of Kalgoorlie-Boulder, Western Australia (Figure 2-1).

2.1 Objectives

The flora/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:

- Gather background information on flora and vegetation in the desktop study area (literature review, database and map-based searches).
- Conduct a field survey to verify / ground truth the desktop assessment findings through reconnaissance survey.
- 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 V – 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 Environmental Protection Authority (EPA) guidelines.
- Assess the species composition of each quadrat.
- 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 Pests) within the survey area;
- Provide a map showing the distribution of conservation significant flora/vegetation within the survey area; and
- Define and map the condition of vegetation within the survey area in accordance with 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).

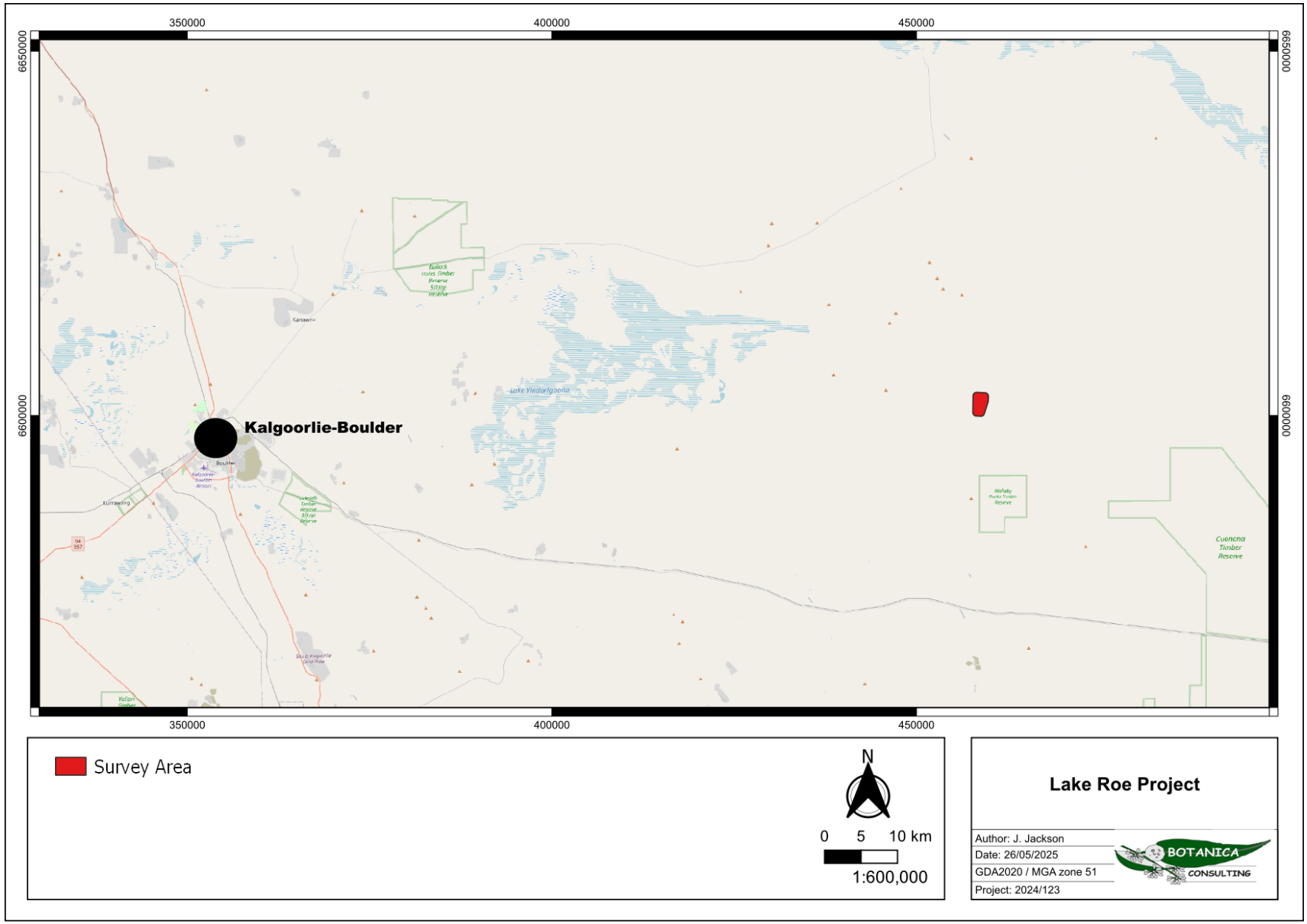

Figure 2-1: Regional map of the survey area

3 REGIONAL BIOPHYSICAL ENVIRONMENT

3.1 Regional Environment

The survey area lies within the Eremaean Province of Western Australia (WA). Based on the Interim Biogeographic Regionalisation of Australia (IBRA) (DCCEEW, 2020 the survey area lies within the Eastern Goldfields (COO3) subregion of the Coolgardie Bioregion (Figure 3-1).

The Eastern Goldfields subregion (5,102,428 ha) lies on the Yilgarn Craton's Eastern Goldfields Terrain, which is described as gently undulating plains with a subdued relief, interrupted in the west with low hills and ridges of Archaean greenstones and in the east by a horst of Proterozoic basic granulite. The underlying geology is of gneisses and granites eroded into a flat plane covered with tertiary soils and with scattered exposures of bedrock. Calcareous earths are the dominant soil group and cover much of the plains and greenstone areas. A series of large playa lakes in the western half are the remnants of an ancient major drainage line (Cowan, 2001).

The vegetation consists of Mallees, Acacia thickets and shrub-heaths on sandplains, with diverse *Eucalyptus* woodlands occurring around salt lakes, on ranges, and in valleys. Salt lakes support dwarf shrublands of samphire. Woodlands and *Dodonaea* shrubland occur on basic granulite of the Fraser Range, and the area is rich in endemic Acacias.

3.2 Land Use

The dominant land uses of the Eastern Goldfields subregion include Unallocated Crown Land (UCL) and Crown reserves and pastoral grazing, with conservation areas and mining leases also present (Cowan, 2001).

The survey area is within the City of Kalgoorlie-Boulder on the Yindi Pastoral Lease.

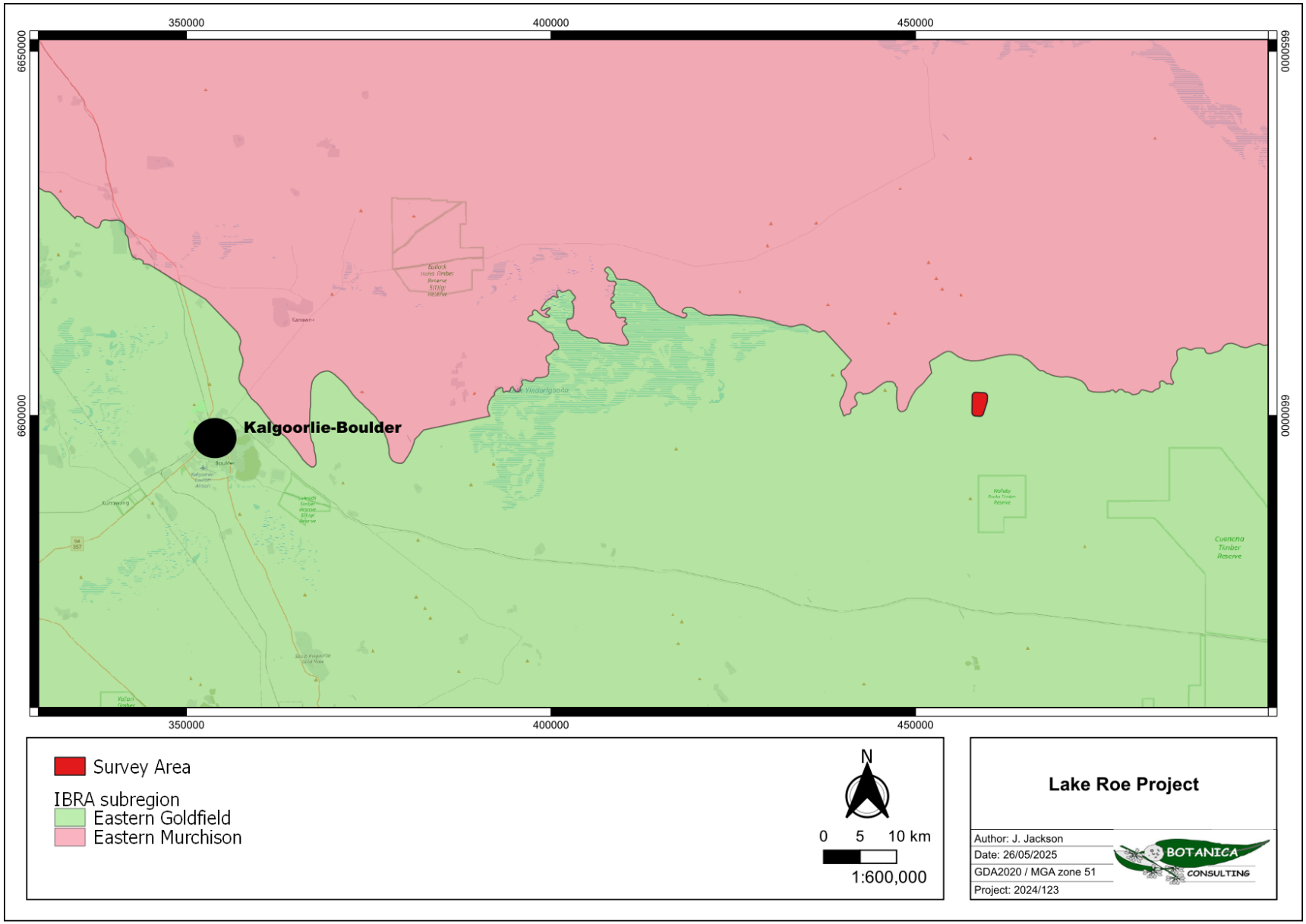

Figure 3-1: Map of IBRA subregions in relation to the survey area

3.3 Soil Landscape Systems

The survey area lies within the Kalgoorlie Province, located in the southern Goldfields between Paynes Find, Menzies, Southern Cross and Balladonia. The landscape consists of undulating plains (with some sandplains, hills and salt lakes) on the granitic rocks and greenstone of the Yilgarn Craton. Soils range from calcareous loamy earths and red loamy earths with some salt lake soils to red deep sands, yellow sandy earths, shallow loams and loamy duplexes. Vegetation communities are predominately Eucalypt woodlands with some acacia-casuarina thickets, mulga shrublands, halophytic shrublands and spinifex grasslands (Tille, 2006).

The Kalgoorlie Province is further divided into six soil-landscape zones, with the survey area located within the Kambalda Zone (265).

The Kambalda zone (265) is located in the south-eastern Goldfields between Menzies, Norseman and the Fraser Range and contains flat to undulating plains (with hills, ranges and some salt lakes and stony plains) on greenstone and granitic rocks of the Yilgarn Craton. Soils consist of calcareous loamy earths and red loamy earths with salt lakes soils and some red brown hardpan shallow loams and red sandy duplexes. Vegetation includes red mallee, blackbutt-salmon gum-gimlet woodlands with mulga and halophytic shrublands and some spinifex grasslands (Tille, 2006).

The soil landscape zones are further divided into soil landscape systems, with the survey area located within two landscape systems, as described in described in Table 3-1 and shown in Figure 3-2 (Government of Western Australia, 2019).

Table 3-1: Soil landscape systems within the survey area

Zone	Landscape System/ Mapping Unit	Description
Kambalda	Carnegie (265 Ca)	Salt lakes with fringing saline alluvial plains, kopi dunes and sandy banks, supporting halophytic shrublands and acacia tall shrublands.
	Mx43 (265 Mx43)	Gently undulating valley plains and pediments; some outcrop of basic rock

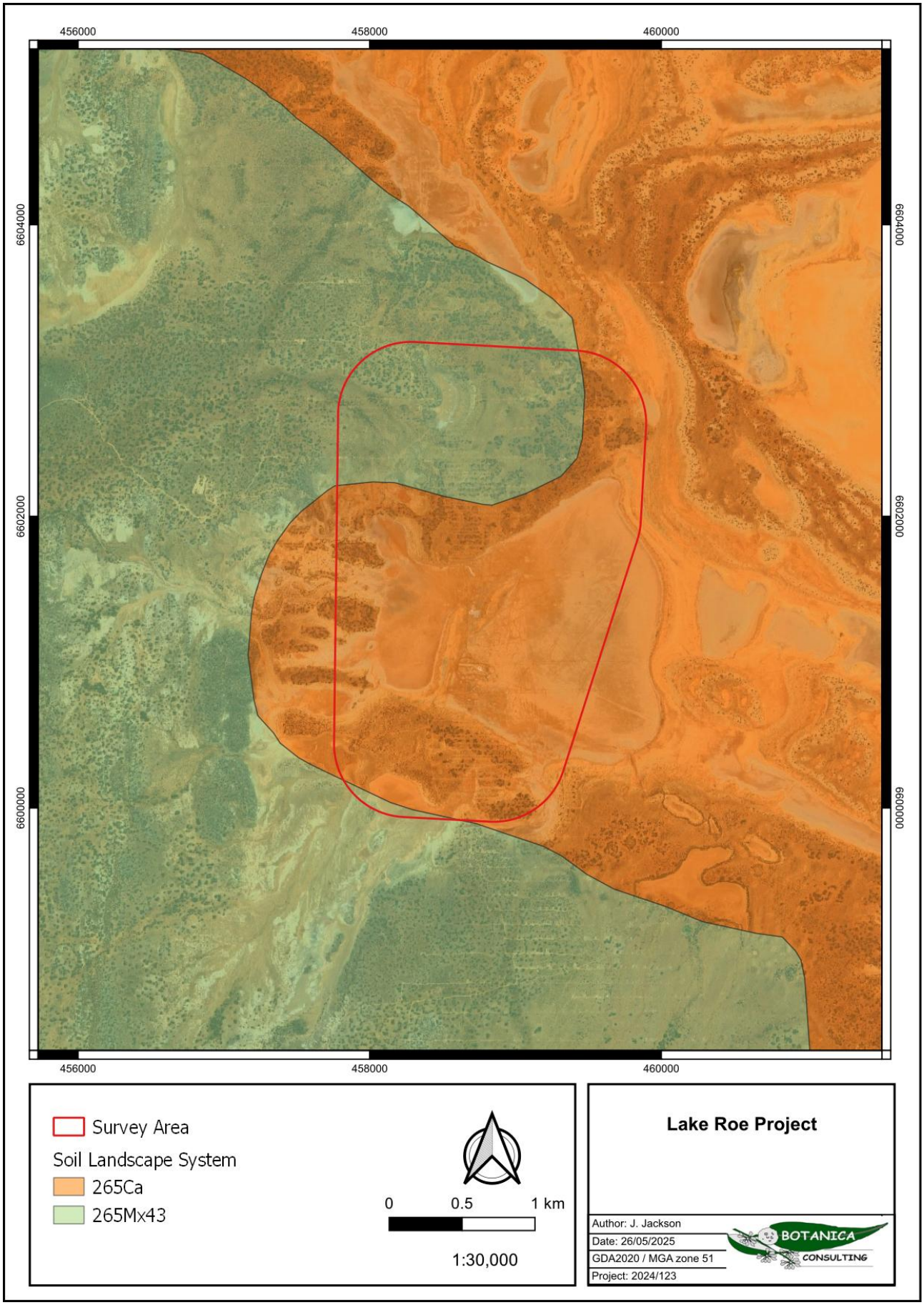

Figure 3-2: Map of soil landscape systems within the survey area

3.4 Vegetation

The survey area is situated in the Kalgoorlie Province as defined by Tille (2006). The Vegetation of the Kalgoorlie Province is described by Tille as woodlands of redwood (*Eucalyptus transcontinentalis*), red mallee (*E*. *oleosa*), Dundas blackbutt (*E*. *dundasii*), merrit (E. flocktoniae) and salmon gum (E. salmonophloia), found on undulating plains over granite. There are also some hummock grasslands with red mallee over spinifex (*Triodia scariosa*) and thickets of Acacia, Casuarina and Melaleuca spp. Plains on greenstone have woodlands of York gum (*E*. *loxophleba*), salmon gum and gimlet (*E*. *salubris*). The valley plains have woodlands of salmon gum, red mallee, Goldfields blackbutt (*E*. *lesouefii*), gimlet, York gum and morrel (*E*. *longicornis*). These sometimes have an understorey of saltbush (Atriplex spp.), pearl bluebush (*Maireana sedifolia*), sago bluebush (*M*. *pyramidata*) and *Eremophila* spp. There are areas of spinifex grasslands with red mallee, mallees (e.g., E. youngiana) and marble gum (*E*. *gongylocarpa*). Low woodlands of mulga (Acacia aneura) and black sheoak (*Casuarina pauper*) over bluebush and saltbush are also present. Apart from the bare Salt Lake surfaces, saline valley floors have shrublands of samphire (*Tecticornia* spp.) and *Frankenia* spp. in lower areas, shrublands of saltbush and bluebush on red deep sandy duplexes, and woodlands of salmon gum, merrit, red mallee, gimlet and York gum. *Acacia neurophylla*, *A*. *beauverdiana* and *A*. *resinimarginea* thickets grow on gently sloping uplands on granite, with thickets of acacia, casuarina and melaleuca. There are also scrub-heaths and York gum-salmon gum-gimlet woodlands on these uplands. The hilly terrain on greenstone supports woodlands of salmon gum, Goldfields blackbutt, coral gum (*E*. *torquata*), York gum, gimlet, morrel, Dundas blackbutt and black sheoak. Thickets of granite wattle (*Acacia quadrimarginea*) are also present. The stony plains support scattered woodlands of Goldfields blackbutt, gimlet and salmon gum, along with shrublands of saltbush and bluebush. Sandplains in the west have acacia (*A*. *coolgardiensis*, *A*. *ramulosa*, *A*. *aneura*, *A*. *burkittii* and *A*. *tetragonophylla*) shrublands, commonly with patchy native pine (*Callitris columellaris, C*. *preissii*) and mallees (*E*. *leptopoda*, *E*. *longicornis* and *E*. *loxophleba*). Native box (*Bursaria occidentalis*), *Melaleuca uncinata* and *Hakea recurva* may also be present. Hard spinifex (*T*. *basedowii*) grasslands with mulga, marble gum and mallees (e.g., *E*. *kingsmillii*) are found on sandplains to the east. The sandy-surfaced plains support acacia, casuarina and melaleuca thickets; woodlands of York gum, cypress pine (*Callitris columellaris*), salmon gum, gimlet and mulga; and shrublands of bowgada (*A*. *ramulosa*).

3.4.1 Pre-European Vegetation

The pre-European vegetation association dataset (DPIRD, 2018) identified three vegetation associations occurring within the survey area (Figure 3-3). The association descriptions and their remaining extent, as specified in the 2018 Statewide Vegetation Statistics (DBCA, 2019) are provided in Table 3-2.

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 3-2: Beard vegetation associations within the survey area

IBRA Subregion	Vegetation Association	Pre-European Extent Remaining (%)	% of current extent within DBCA managed lands	Vegetation Description (Beard, 1990)
Eastern Goldfields (COO3)	Zanthus_125	99.83	0	Salt lake, lagoon, clay pan
	Zanthus_480	100	0	Maireana spp. with *Acacia aneura, A. papyrocarpa, Allocasuarina cristata*
	Zanthus_481	99.99	<1 % (16.9 ha)	Woodland / Shrub (mallee) steppe

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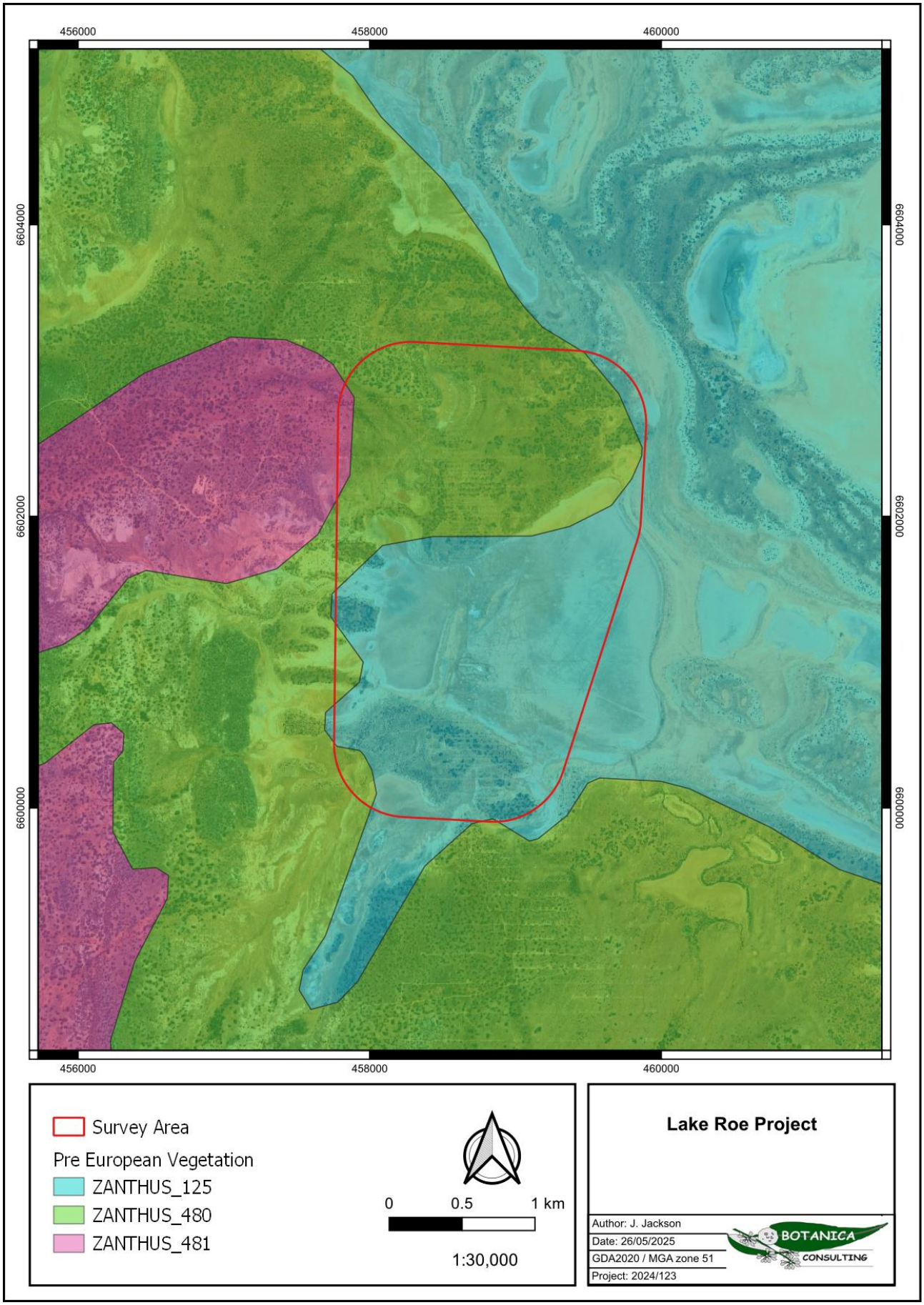
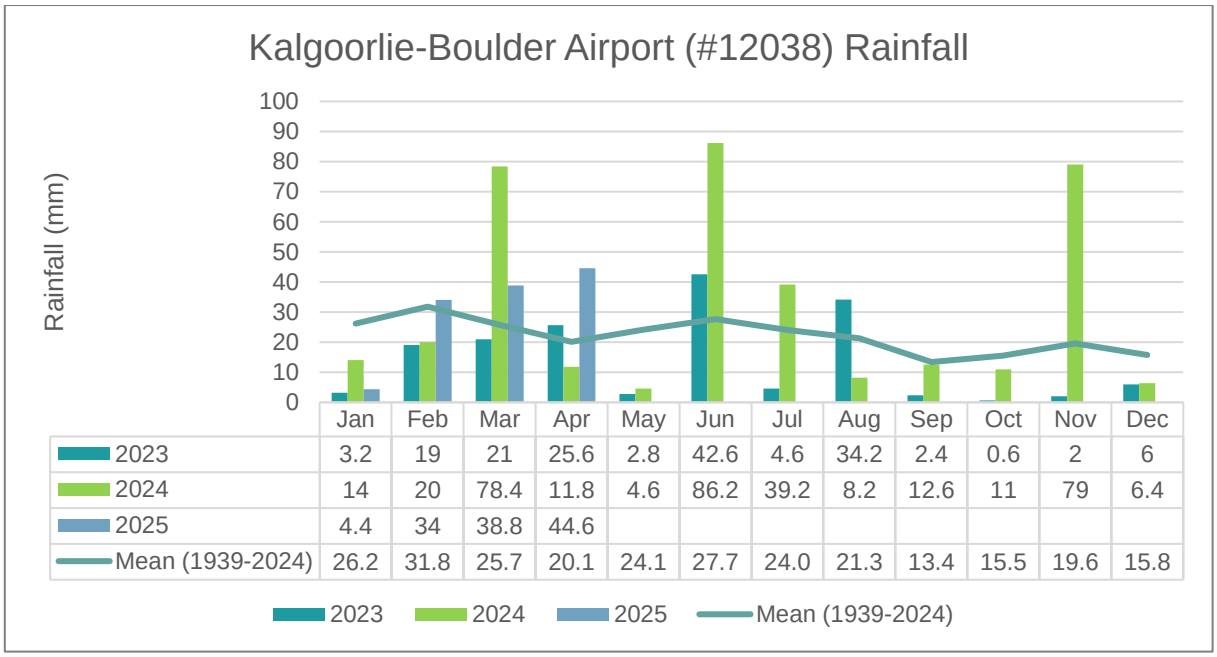


Figure 3-3: Pre-European vegetation associations within the survey area

3.5 Climate

The climate of the Eastern Goldfield subregion is characterised as arid to semi-arid with 200-300 mm of rainfall, sometimes in summer but usually in winter (Cowan, 2001). Rainfall data for the Kalgoorlie-Boulder weather station (#12038) located approximately 105 km west of the survey area is shown in Figure 3-4 (BoM, 2025a). Rainfall received in February, prior to the March survey, was above average. Rainfall received in March and April prior to the revisit in late April, was also above average.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	3.2	19	21	25.6	2.8	42.6	4.6	34.2	2.4	0.6	2	6
2024	14	20	78.4	11.8	4.6	86.2	39.2	8.2	12.6	11	79	6.4
2025	4.4	34	38.8	44.6								
Mean (1939-2024)	26.2	31.8	25.7	20.1	24.1	27.7	24.0	21.3	13.4	15.5	19.6	15.8

Figure 3-4: Monthly rainfall for the Kalgoorlie-Boulder weather station (#12038) (BoM, 2025a)

3.6 Conservation Values

No Threatened Ecological Communities (TEC) 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. No DBCA listed Priority Ecological Communities (PEC) are known to occur within the survey area. One Priority 3 PEC is located 40 km south of the survey area:

1. Mount Belches Banded Ironstone Formation. Located approximately 40km south of the survey area.

There are no Ramsar wetlands of international importance or sites listed in the Directory of Important (DIWA) (i.e., wetlands of national importance) 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.

There are no Reserves in the survey area, the nearest gazetted Reserve the Wallaby Rocks Timber Reserve (R1974) and is 8.2 km south of the survey area. This reserve is gazetted with the Conservation and Parks Commission of WA for the purposes of 'timber - sandalwood' (Figure 3-5).

3.6.1 Great Western Woodlands

The survey area lies within the Great Western Woodlands (GWW), considered by The Wilderness Society of WA to be of global biological and conservation importance as one of the largest and healthiest temperate woodlands on Earth, containing many endemic taxa. The region covers almost 16 million hectares (160,000 square kilometres), from the southern edge of the Western Australian Wheatbelt to the pastoral lands of the Mulga country in the north, the inland deserts to the northeast, and the treeless Nullarbor Plain to the east.

The Great Western Woodlands provides a connection between southwest forests and inland deserts (Gondwana Link) as well as linking the north-west passage to Shark Bay. The majority of the Great Western Woodlands is unallocated crown land (61.1%) with other interests including pastoral leases (20.4%), conservation reserves (15.4%) unallocated crown land, ex pastoral (2%) managed by the Department of Biodiversity, Conservation and Attractions (DBCA) and private land (approximately 1%).

No specific management strategy or formal conservation status applies to the Great Western Woodlands. The Great Western Woodlands currently includes towns, highways, roads, railways, private property, Crown Reserves, agricultural activities and mining tenements.

A map showing conservation areas in relation to the assessment area is provided in Figure 3-5.

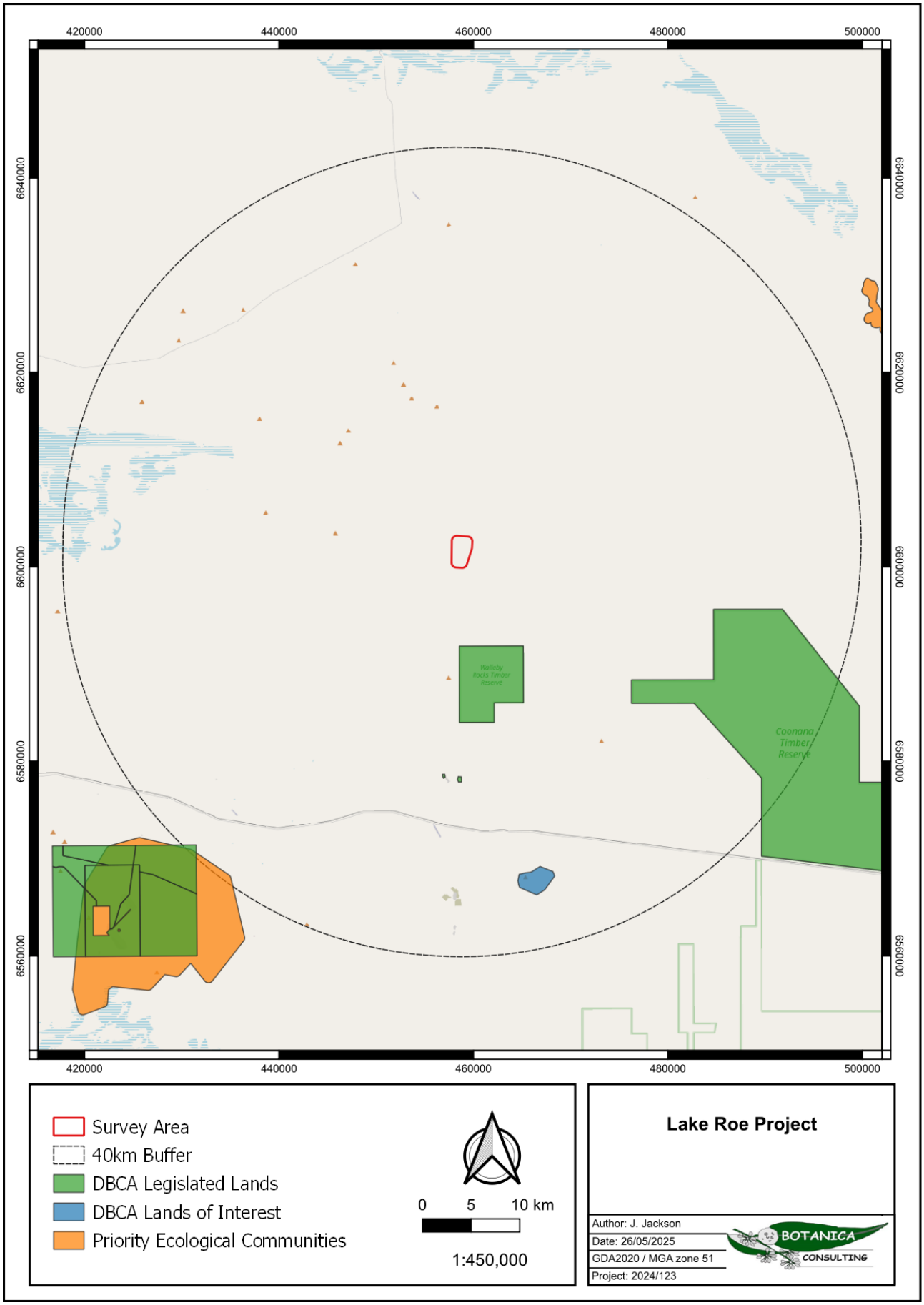


Figure 3-5: Conservation Values in relation to the survey area

3.7 Hydrology

According to the Geoscience Australia database (2015), there are no permanent/ perennial inland waters in the survey area. There is one minor ephemeral drainage line which drains into Lake Roe, located within the survey area. Lake Roe is not a DIWA wetland and is listed as a 'Non-perennial Lake' in the Surface Hydrology (Regional) data set (Geoscience Australia, 2015).

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, 2025b), there are no known or potential aquatic GDEs in the survey area. The survey area contains two potential terrestrial GDE, varying from moderate to high potential (Table 3-3, Figure 3-6).

Table 3-3: Potential Terrestrial Groundwater Dependent Ecosystems within the survey area

Geomorphology	Ecosystem Description	Potential Groundwater Dependence (BoM, 2025b)
Undulating plains with some sandplains, ferruginous breakaways; ridges of metamorphic rocks and granitic hills and rises; calcretes, large salt lakes and dunes along valleys.	Bare areas, salt lakes.	High
	Mosaic: Medium woodland; salmon gum & red mallee / Hummock grasslands, mallee steppe; red mallee over spinifex (*Triodia scariosa*).	Moderate

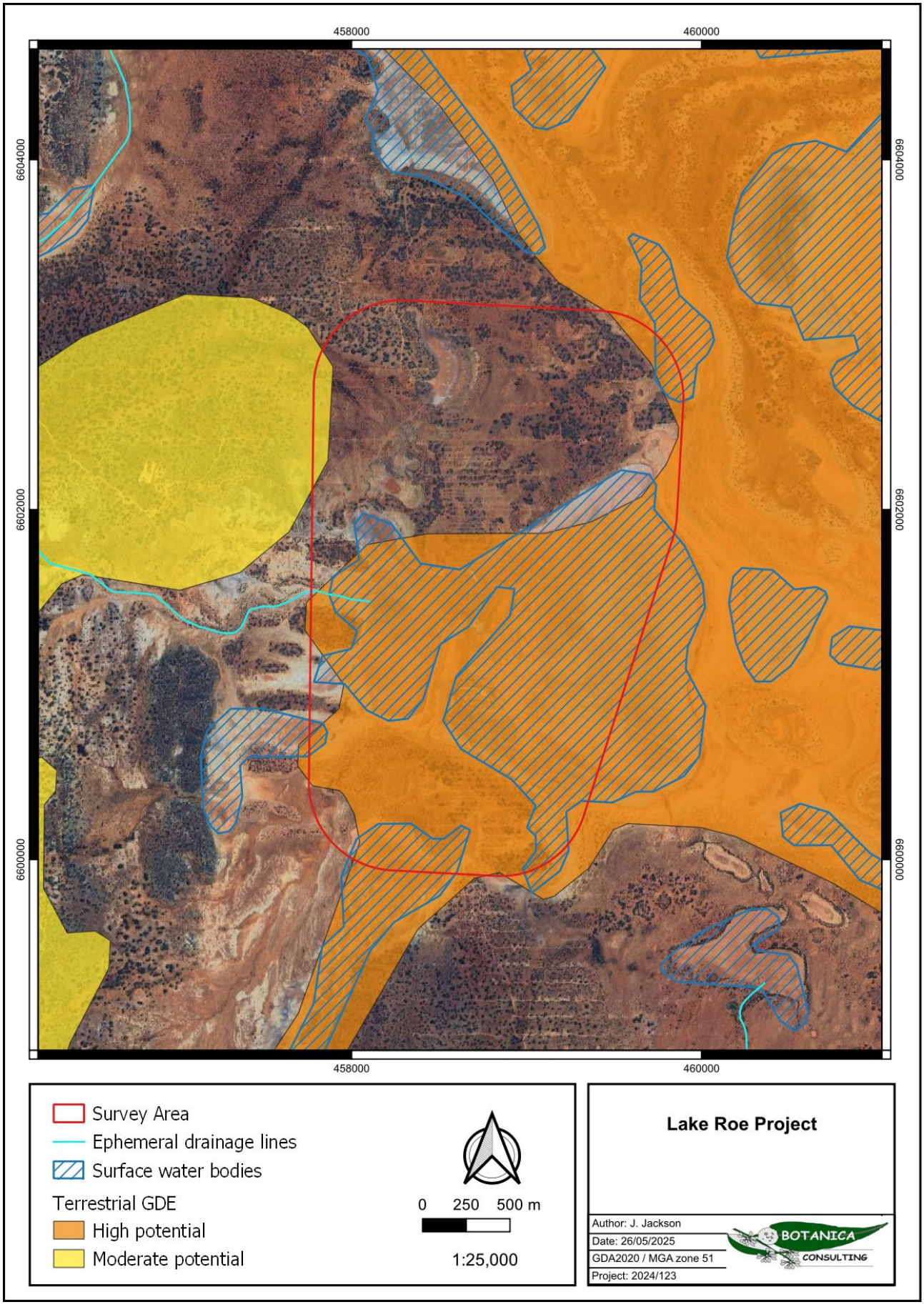


Figure 3-6: Regional hydrology of the survey area

4 SURVEY METHODOLOGY

4.1 Desktop Assessment

Prior to the field assessment a literature review was undertaken of previous flora assessments conducted within the local region. Documents reviewed included:

- Botanica Consulting, (2023). *Lake Rebecca Project: Detailed Flora and Fauna Survey.* Prepared for AC Minerals Pty. Ltd., July 2023.
- Botanica Consulting, (2024). *Lake Rebecca Project: Reconnaissance and Targeted Flora and Basic Fauna Survey.* Prepared for AC Minerals Pty. Ltd., July 2024.
- Botanica Consulting, (2025). *Rebecca to Roe Haul Road: Detailed Flora and Basic Fauna Survey.* Prepared for AC Minerals Pty. Ltd., May 2025.
- Maia Environmental (2022). *Lake Rebecca Project Area Detailed Flora and Vegetation Assessment.* Prepared for Ramelius Resources Ltd., March 2022.
- Stantec (2018). *Lake Roe Gold Project: Environmental desktop assessment*. Prepared for Breaker Resources, August 2018.
- Stantec (2020). *Lake Roe Gold Project: Detailed flora and vegetation survey*. Prepared for Breaker Resources, June 2020.
- Terrestrial Ecosystems (2025). *Basic Vertebrate Fauna Survey. Lake Roe Gold Project.* Prepared for Ramelius Resources Ltd. V2. March 2025.
- Western Australian Museum (1992). *The Biological Survey of the Eastern Goldfields of Western Australia, Part 8: Kurnalpi – Kalgoorlie Study Area.* Records of the Western Australian Museum, Supplement No. 41.
- Waddell, P. A., and Galloway, P. D. (2023). *Land systems, soils and vegetation of the southern Goldfields and Great Western Woodlands of Western Australia.* Technical bulletin 99, vol 1, Department of Primary Industries and Regional Development, Western Australian Government.

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

- Department of Biodiversity, Conservation and Attractions (DBCA) Priority/ Threatened Flora Database Search (Ref 47-0325FLFL) (DBCA, 2025a),
- DBCA Priority/ Threatened Ecological Communities Database Search (Ref 23-0325EC) (DBCA, 2024b)
- DBCA Dandjoo database (DBCA, 2025); and

- Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters search tool (DCCEEW, 2025a).

The Dandjoo and Protected Matters Search were conducted for an area encompassing a 40 km radius surrounding the survey area. It should be noted that these lists may be based on observations from a broader area than the assessment area (40 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.

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

- *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999*. Administered by the Australian Government (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 list. A non-legislative list maintained by DBCA for management purposes (updated April 2025).

4.2 Flora and Vegetation Field Assessment

Botanica conducted a detailed flora and vegetation survey and targeted flora survey between the 12th to the 13th March 2025. The survey area was traversed by three people using a four wheel drive vehicle and on foot. A follow-up survey was done on the 30th April 2025 by two people using a four wheel drive vehicle and on foot (Figure 4-1).

Three quadrats that were installed and surveyed by Stantec in 2018 (Stantec, 2020) were relocated and resurveyed, they are Quadrats 20, 21 and 22.

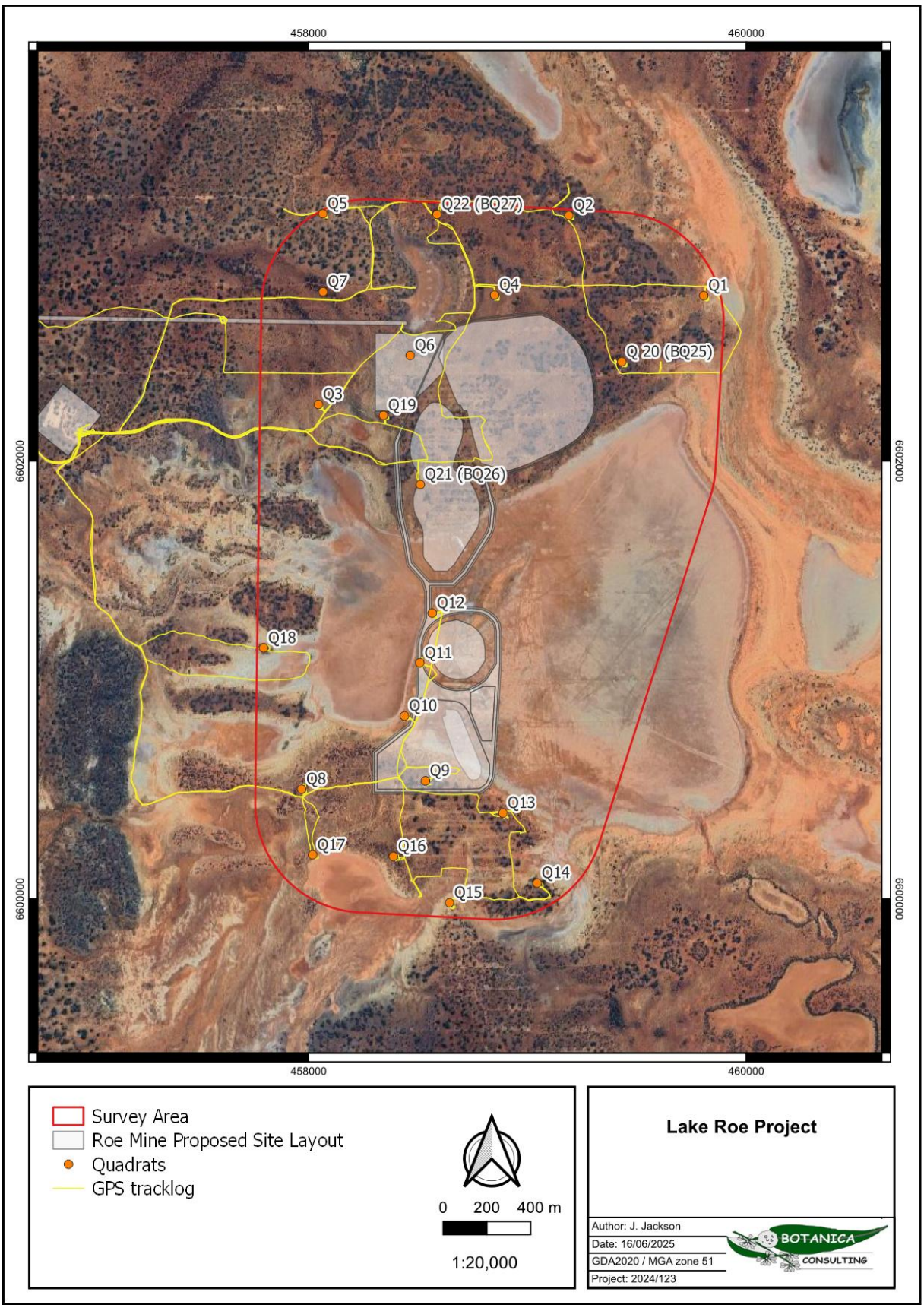


Figure 4-1: Quadrat locations, survey area boundary and tracks traversed in the survey area

4.2.1 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.

4.2.2 Detailed Flora and Vegetation Survey

Twenty-two quadrats were established within the survey area (Figure 4-1 and APPENDIX D). According to the recommended quadrat size specified in the Environmental Protection Authority (EPA) Guidelines, 20m x 20m quadrats are recommended for the Coolgardie Bioregion. The quadrats were established by inserting survey markers into the NW corner and measuring the length of the resultant boundaries to verify the quadrats were 20 m x 20 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 NW corner of each quadrat was recorded by GPS and three photographs of the quadrat were taken from the NW corner (

Appendix F). All vascular plants within the quadrat were recorded (Appendix E). 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 E). Methods of recording data from these quadrats largely follow those outlined in CSIRO's *Australian Soil and Land Survey Field Handbook* (McDonald *et al.* 2024) and in accordance with EPA Guidelines (2016). Presence/absence data of taxa from sample sites were used to compile the representative vegetation types.

4.2.3 Flora Identification

Unknown specimens collected during the survey were identified with the aid of samples housed at the Botanica Herbarium and the Western Australian Herbarium.

4.3 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 were generated using QGIS.

4.3.1 PATN Analysis

The PATN software package was used to assess the similarities/ dissimilarities between quadrats based on presence/absence of species. Eight annual taxa were recorded during the survey which were excluded from the analysis, four subspecies were reconciled into two species and 34 singleton taxa were also excluded. A total of 55 taxa recorded within the quadrats were included in 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.).

4.3.2 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.

4.4 Personnel Involved

Table 4-1: Personnel involved with the flora survey reporting

Staff Member	Position/ Qualifications	Experience	Tasks conducted during survey
Jim Williams	Environmental Consultant/Botanist/ Director (Diploma of Horticulture)	30 years experience across WA	Project Management (Lead Botanist). Assistance with identifying flora species within quadrats and opportunistic flora observations. Mapping vegetation types. Review of report.
Jennifer Jackson	Environmental Consultant (BSc-Honours Environmental Management)	20 years experience across WA	Flora and vegetation survey- identifying flora species within quadrats and opportunistic flora observations. Identifying and recording vegetation types. Assist with mapping.
Kaitly Berryman	Graduate Environmental Consultant (BSc Environmental Science)	1 year experience in WA	Assisting with flora survey, data entry.
Lauren Pick	Senior Environmental Consultant (BSc Conservation Biology)	20 years experience across WA	Statistical analysis.

4.5 Scientific Licences

Table 4-2: Scientific Licences of Botanica Staff coordinating the survey

Licensed Staff	Permit Number	Valid to
Jennifer Jackson	FB62000309-2 (licence to take flora for scientific purposes)	11/01/2027
Jim Williams	BA27001135 (Licence to take fauna for scientific purposes)	11/09/2025

4.6 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 4-3.

Table 4-3: Limitations and constraints associated with the flora surveys

Variable	Potential Impact on Survey	Details
Access problems	Not a constraint	The survey was conducted using a four wheel drive vehicle and on foot. Numerous access tracks were present within the survey area providing ease of access.
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) **Field Staff**: Jennifer Jackson (Botanist); Kaitlyn Berryman (BSc Env. Science) **Data Interpretation**: Jim Williams, Jennifer Jackson and Lauren Pick.
Timing of survey, weather & season	Minor constraint	Fieldwork was not undertaken during the EPA's recommended primary survey time period for the Interzone (i.e., Spring), however the survey was conducted following above average rainfall received in February and March 2025. However, only a few annual species were present.
Area disturbance	Not a constraint	The area has been disturbed from previous mining and exploration, cattle 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 Coolgardie 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.
Data Analysis	Minor constraint	Botanica staff conducting the PATN statistical analyses are not statistical analysts and have basic statistics training. These analyses were used to provide basic information on the relationships between vegetation communities delineated in the field.
Completeness	Minor constraint	In the opinion of Botanica, the survey area was covered sufficiently to identify vegetation assemblages. Fieldwork was undertaken outside the EPA's recommended primary survey time period for the Interzone (i.e., Spring), however the survey was conducted following above average rainfall received in February and March 2025. As a result all taxa were able to be identified to species level, however only a few 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

Variable	Potential Impact on Survey	Details
		comparison to vegetation distributions throughout WA given on NVIS (DotEE, 2017).

5 RESULTS

5.1 Desktop Assessment

5.1.1 Flora

According to the results of the Dandjoo search (DBCA, 2025d), a total of 235 flora taxa have previously been collected within a 40 km radius of the survey area. Dominant genera include *Acacia, Eremophila,* and *Eucalyptus (*Appendix H*).*

5.1.2 Introduced Flora

Results of database searches identified 14 introduced taxa as having previously been recorded within a 40 km radius of the survey area (Table 5-1). No taxa are listed as a Declared Pest under the BAM Act or a Weed of National Significance (WoNS) by the Commonwealth DCCEEW.

Table 5-1: Introduced flora previously recorded within 40 km of the survey area

Family	Taxon	Common Name	WAOL Status	WONS
Asteraceae	*Monoculus monstrosus*	Stinking Roger	Permitted - s11	No
Asteraceae	*Centaurea melitensis*	Maltese cockspur	Permitted - s11	No
Asteraceae	*Oligocarpus calendulaceus*	-	Permitted - s11	No
Asteraceae	*Oncosiphon suffruticosum*	Calomba Daisy	Permitted - s11	No
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	Permitted - s11	No
Boraginaceae	*Heliotropium europaeum*	Common Heliotrope	Permitted - s11	No
Brassicaceae	*Sisymbrium erysimoides*	Smooth Mustard	Permitted - s11	No
Fabaceae	*Medicago laciniata*	Cutleaf medic	Permitted - s11	No
Geraniaceae	*Erodium aureum*	-	Permitted - s11	No
Lamiaceae	*Salvia verbenaca*	Wild Sage	Permitted - s11	No
Poaceae	*Schismus arabicus*	Araby grass	Permitted - s11	No
Primulaceae	*Lysimachia arvensis*	Pimpernel	Permitted - s11	No
Caryophyllaceae	*Silene gallica*	French catchfly	Permitted - s11	No
Solanaceae	*Solanum hoplopetalum*	Thorny Solanum	Permitted - s11	No

5.1.3 Conservation Significant Flora

The results of the literature review, combined search of the Flora of Conservation Significance databases (DBCA, 2024a), Dandjoo search (DBCA, 2025) and Protected Matters Search (DCCEEW, 2025a) indicated that no Threatened Flora or Priority Flora species have previously recorded within the survey area.

As listed in Table 5-2 below, seventeen Priority flora have previously been collected within a 40 km radius of the survey area (map of flora locations provided in Figure 5-1).

Table 5-2: Likelihood of occurrence for Threatened and Priority flora within the survey area

Taxon	EPBC Act	BC Act	DBCA Priority Rating	Habitat Description (WAHERB, 1998-, DBCA, 2025a)	Likelihood of Occurrence
Acacia eremophila var. Numerous-nerved variant (A.S. George 11924)			P3	Sandy soils. Flats.	Previously recorded north of this area (Maia 2022, Botanica 2024).
Allocasuarina eriochlamys subsp. *grossa*			P2	Stony loam, laterite clay. Granite outcrops.	Unlikely, this habitat is not present in the survey area.
Austrostipa turbinata			P3	Lower slope, clay pan	Possible
Eremophila arachnoides subsp. *tenera*			P3	Flat plain with calcareous sandy loam soils.	Previously recorded north of this area (Maia 2022, Botanica 2024, 2025).
Eremophila perglandulosa			P1	Orange- brown sandy loam	Previously recorded east of this area (Botanica 2024).
Eremophila praecox			P2	Red/brown sandy loam. Undulating plains.	Previously recorded north of this area (Maia 2022, Botanica 2024).
Eucalyptus kruseana			P4	Sandy loam. Granite outcrops & hills.	Unlikely, this habitat is not present in the survey area.
Eucalyptus x brachyphylla			P4	Sandy loam. Granite outcrops.	Unlikely, this habitat is not present in the survey area.
Goodenia jaurdiensis			P2	Red clayey loam with laterite or banded ironstone gravel or quartz pebbles. Low-lying plains and lower slopes.	Unlikely, this habitat is not present in the survey area.
Grevillea phillipsiana			P1	Red sand, stony loam. Granite hills.	Unlikely, this habitat is not present in the survey area.
Lepidosperma lyonsii			P1	Gentle hill slopes, upper slopes of large hill.	Unlikely, this habitat is not present in the survey area.
Melaleuca coccinea			P3	Sandy loam over granite. Granite outcrops, sandplain, river valleys.	Unlikely, this habitat is not present in the survey area.
Micromyrtus serrulata			P3	Brownish sandy and clayey soils over granite.	Unlikely, this habitat is not present in the survey area.
Notisia intonsa			P3	Brown clay loam with ironstone	Unlikely, this habitat is not present in the survey area.
Pterostylis xerampelina			P1	Large sprawling granite complex.	Unlikely, this habitat is not present in the survey area.
Ptilotus rigidus			P1	Quartz outcropping.	Unlikely, this habitat is not present in the survey area.
Stackhousia muricata subsp. *Perennial*			P3	Granite outcrops	Unlikely, this habitat is not present in the survey area.

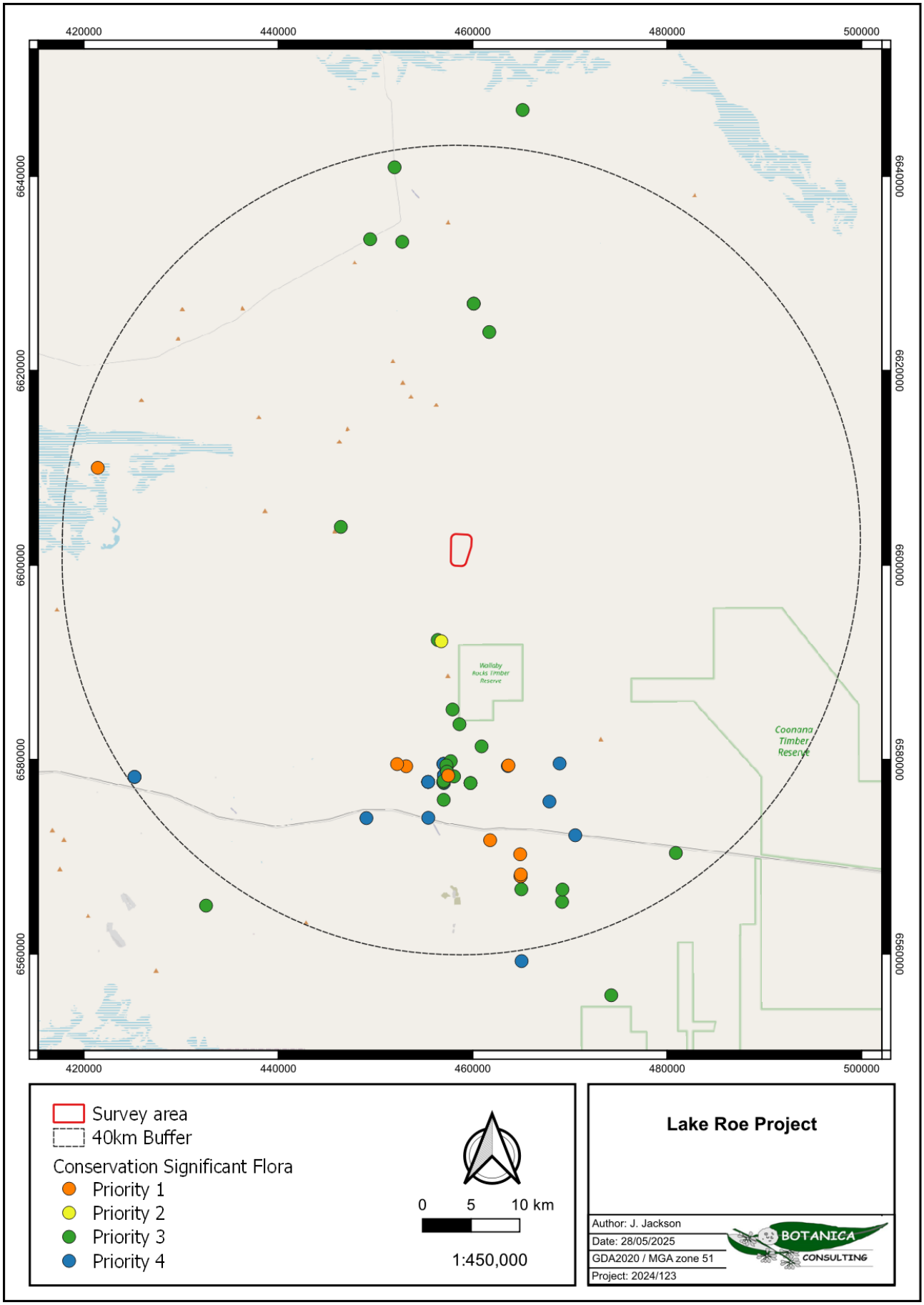


Figure 5-1: Conservation significant flora in relation to the survey area

5.2 Field Assessment

5.2.1 Flora

The field survey identified 21 Families, 45 genera and 96 taxa as occurring in the survey area. Chenopodiaceae was the dominant family with 35 species in the survey area over eight genera. Dominant genera include *Mairena* (12 species), *Tecticornia* (seven species) and Eremophila (six species). Nine annual flora species were present. The total species list is provided in Appendix C.

5.2.2 Introduced Flora

No introduced flora species were observed within the survey area.

5.2.3 Conservation 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.

One Priority 1 species (*Calandrinia quartzitica*) was identified in Q4 and opportunistically near the western edge of the survey area (but outside of quadrats) The locations of these are shown in Figure 5-2.

***Calandrinia quartzitica* (P1)**

Calandrinia quartzitica is an erect perennial herb, to 0.5 m high, it has stem leaves that are very fleshy. Flowers are creamy white tinged with pink or entirely light or mid-pink (Obbens, 2018). Within Western Australia, it has been recorded in the Eastern Murchison IBRA subregion from about nine locations north of Kalgoorlie (WA Herbarium, 1998-) (Plate 5-1Plate 5-1).

Approximately fifty-four individual plants were observed within and just outside the survey area. Approximately 12 plants were found in and around quadrat Q4. The other plants were observed just

outside the survey area on the western boundary. All plants were found in the open depression (OD) landform type. A specimen of a plant in Q4 was collected and sent to the WA Herbarium and it was confirmed as *Calandrinia quartzitica.*

No other Priority flora was observed in the survey area.

Plate 5-1: *Calandrinia quartzitica,* photo of plant in Q4, and photo of plant taken from Obbens (2018).

Two species of Tecticornia were collected from Quadrats 1 and 3 and these will need further survey/collection as the WA Herbarium Tecticornia specialist replied with the following notes (K. Shepherd, 2025):

- From Quadrat 1 *Tecticornia* sp. Roe 2 was noted as “an undescribed taxon that does not match any named species. It is allied to *Tecticornia* aff. *undulata*.”
- From Quadrat 3 *Tecticornia* sp. Roe 1 was noted as a “Sterile specimen, can't confirm ID”.

Stantec (2020) do not discuss any Tecticornia of conservation significance from their 2018 survey, however they list three unidentified species of Tecticornia in their inventory of flora species.

Figure 5-2: Conservation significant flora in the survey area

5.2.4 Vegetation

Eight vegetation types (not including cleared vegetation) were identified within the survey area. These vegetation types were located within three landform types and comprised of six NVIS major vegetation groups (Table 5-3, Figure 5-3).

Table 5-3: Summary of vegetation types within the survey area

Landform	Vegetation Code	NVIS Major Vegetation Group	Vegetation Type	Quadrats	Image
Clay Loam Plain	CLP-CW1 Total area = 11.4 ha (1.9%)	Casuarina Woodlands (MVG 8)	*Casuarina pauper* mid open forest over *Scaevola spinescens, Senna artemisioides* subsp. *filifolia* and *Acacia hemiteles* mid open shrubland over *Ptilotus obovatus* low open shrubland on clay loam plain.	Q7, Q22 (BQ27)	
	CLP-MW1 Total area = 17.3 ha (2.9%)	Mallee Woodlands (MVG 14)	*Eucalyptus oleosa* mid open mallee forest over *Cratystylis conocephala* mid open shrubland over *Olearia muelleri* low sparse shrubland on clay loam plain.	Q5	

Landform	Vegetation Code	NVIS Major Vegetation Group	Vegetation Type	Quadrats	Image
Sandy clay loam plain	SCLP-EW4 Total area = 70.6 ha (11.8%)	Eucalypts Woodlands (MVG 5)	*Eucalyptus oleosa* low woodland over *Cratystylis microphylla* open shrubland over *Triodia scariosa* hummock grassland on sandy clay loam plain.	Q2, Q20, (BQ25)	
Open Depression	OD-CS1 Total area = 209.4 ha (34.8%)	Chenopod Shrublands (MVG 22)	Low chenopod shrubland of mixed *Tecticornia* spp. over *Maireana* spp. and *Atriplex* spp. low sparse open chenopod shrubland in open depression.	Q1, Q4, Q6, Q10, Q11, Q12, Q17, Q19, Q21	

Landform	Vegetation Code	NVIS Major Vegetation Group	Vegetation Type	Quadrats	Image
Sand Dune	SD-AW1 Total area = 15.3 ha (2.5%)	Acacia Forest and Woodland (MVG 6)	*Acacia ramulosa* and/or *A. caesaneura* low woodland over *Cratystylis microphylla* mid open shrubland over *Rhagodia eremaea* and *Ptilotus obovatus* low sparse shrubland on sand dune.	Q8, Q16	
	SD-Callitris Total area = 8.1 ha (1.3%)	Callitris Woodlands (MVG 7)	*Callitris preissii* low woodland over *Dodonaea viscosa* mid open shrubland over *Triodia scariosa* low hummock grassland on sand dune.	Q13	

Sand Dune	SD-CW1 Total area = 0.7 ha (0.1%)	Casuarina Woodlands (MVG 8)	*Casuarina pauper* low woodland over *Acacia kalgoorliensis* mid open *shrubland* over *Cratystylis microphylla* low open shrubland on sand dune.	Q15	
	SD-MW2 Total area = 33.7 ha (5.6%)	Mallee woodlands (MVG 14)	*Eucalyptus horistes* open mallee forest over *Cratystylis microphylla* and *Eremophila scoparia* open mid shrubland over *Triodia scariosa* low open hummock grassland on sand dune.	Q9, Q14, Q18	
N/A	CV Total area 233.5 ha (38.8%)	Cleared areas	CV	N/A	

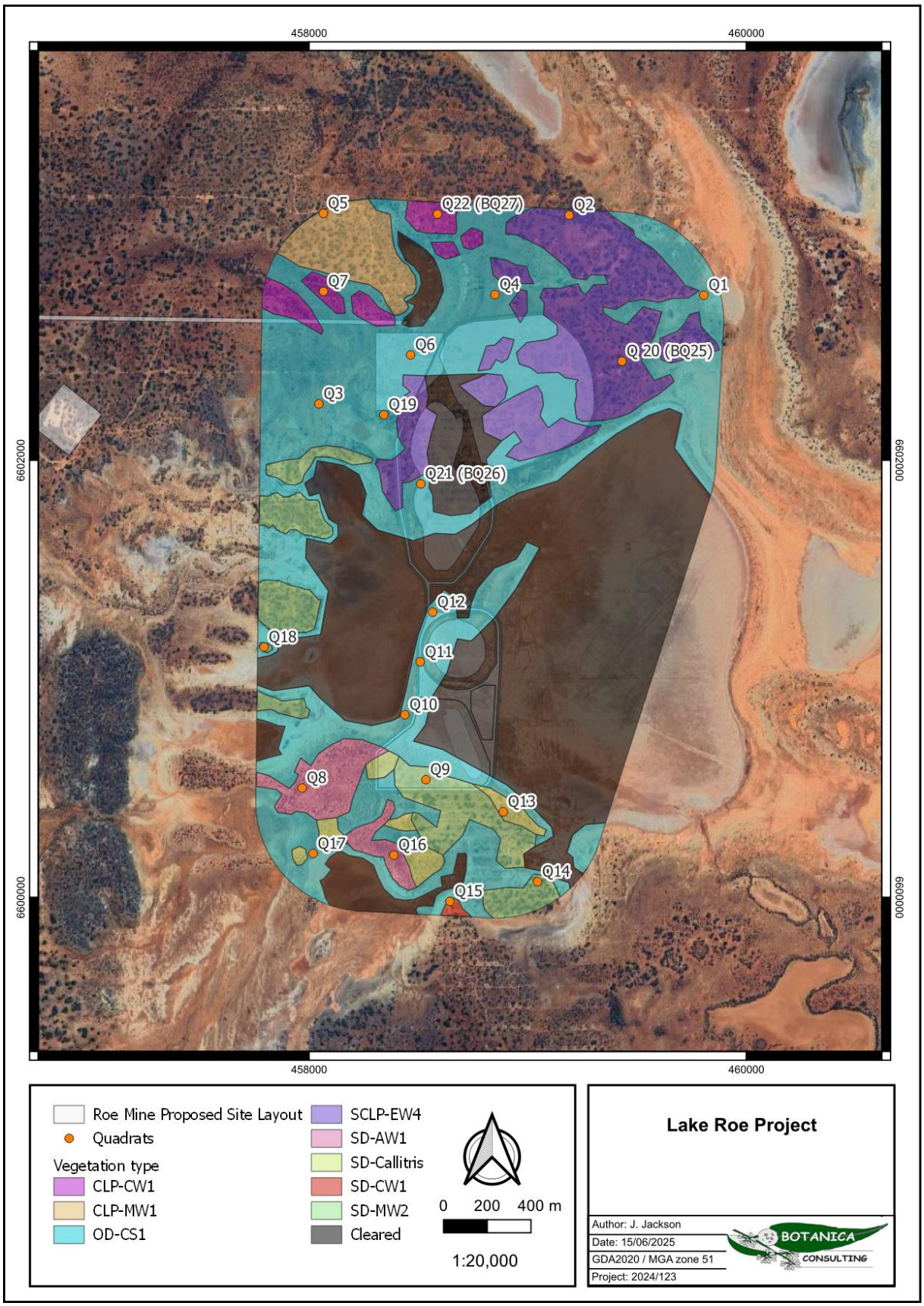


Figure 5-3: Vegetation types within the survey area

5.2.5 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. Appendix G provides the dendrogram, two-way table and ordination graph generated from the PATN statistical analysis. A list of the twenty-two quadrats and their respective vegetation associations are provided in Table 5-4 below. The PATN analysis produced a stress value of 0.1579.

Table 5-4: **Vegetation types with corresponding quadrats**

Vegetation Type	Vegetation Code	Quadrat
Casuarina pauper mid open forest over *Scaevola spinescens, Senna artemisioides* subsp. *filifolia* and *Acacia hemiteles* mid open shrubland over *Ptilotus obovatus* low open shrubland on clay loam plain.	CLP-CW1	Q7, Q22
Eucalyptus oleosa mid open mallee forest over *Cratystylis conocephala* mid open shrubland over *Olearia muelleri* low sparse shrubland on clay loam plain.	CLP-MW1	Q5
Eucalyptus oleosa low woodland over *Cratystylis microphylla* open shrubland over *Triodia scariosa* hummock grassland on sandy clay loam plain.	SCLP-EW4	Q2, Q20
Low chenopod shrubland of mixed *Tecticornia* spp. over *Maireana* spp. and *Atriplex* spp. low sparse open chenopod shrubland in open depression.	OD-CS1	Q1, Q4, Q6, Q10, Q11, Q12, Q17, Q19, Q21
Acacia ramulosa and/or *A. caesaneura* low woodland over *Cratystylis microphylla* mid open shrubland over *Rhagodia eremaea* and *Ptilotus obovatus* low sparse shrubland on sand dune.	SD-AW1	Q8, Q16
Callitris preissii low woodland over *Dodonaea viscosa* mid open shrubland over *Triodia scariosa* low hummock grassland on sand dune.	SD-Callitris	Q13
Casuarina pauper low woodland over *Acacia kalgoorliensis* mid open *shrubland* over *Cratystylis microphylla* low open shrubland on sand dune.	SD-CW1	Q15
Eucalyptus horistes open mallee forest over *Cratystylis microphylla* and *Eremophila scoparia* open mid shrubland over *Triodia scariosa* low open hummock grassland on sand dune.	SD-MW2	Q9, Q14, Q18

Six species groups were identified in the analysis (species group A to F) as shown in the two-way table (Appendix G).

The first floristic group comprised of quadrats 1, 3, 4, 6 and 21 and was characterised by species groups D, E and F (see two-way table provided in Appendix G) with an average species richness of nine taxa per quadrat (ranged from six to 13 taxa per quadrat).

The second floristic group comprised of quadrats 10, 11, 12 and 21. This floristic group was characterised by species group F (Appendix G). This floristic group had an average species richness of eight taxa per quadrat (ranged from six to nine taxa per quadrat).

The third floristic group comprised of quadrat 5. This floristic group was characterised by species group C (Appendix G). This floristic group with only one quadrat had a species richness of five. This was the CLP-MW1 vegetation type.

The fourth floristic group comprised of quadrats 5, 7, 21 and 22. This floristic group was also mostly characterised by species group C (Appendix G). This floristic group had an average species richness of 12 taxa per quadrat (ranged from nine to 16 taxa per quadrat).

The fifth floristic group comprised of quadrats 8, 9, 13, 15 and 16. This floristic group was mostly characterised by species groups A and B (Appendix G). This floristic group had an average species richness of 15 taxa per quadrat (ranged from 13 to 19 taxa per quadrat).

The sixth floristic group comprised of quadrats (14, 18 and 19). This floristic group was also mostly characterised by species groups A and B (Appendix G). This floristic group had an average species richness of nine taxa per quadrat (ranged from five to 12 taxa per quadrat).

Results of the PATN analysis mostly supported vegetation delineations made in field, with eight distinct floristic groups identified.

5.2.5.1 Species Richness and Accumulation Estimates

The Chao 2 richness estimator provided an estimated species richness of 119 species in 40 sample sites (quadrats). Species richness recorded for the 22 quadrats surveyed was 97 species. A species accumulation curve was created to display the rate of species accumulation. The R^2 value (0.9915) suggests that the data “fits” the species accumulation curve shown in Figure 5-4. Species accumulation ranged from eleven to five species per quadrat from 1-7 sample sites, four species per quadrat from 8-9 sample sites, three species per quadrat from 10-14 sample sites, two species per quadrat from 15-26 sample sites, and one species per quadrat beyond 27 sample sites. Botanica has determined that according to this data a sufficient number of quadrats were established in the survey area to adequately assess the floristic composition of the area.

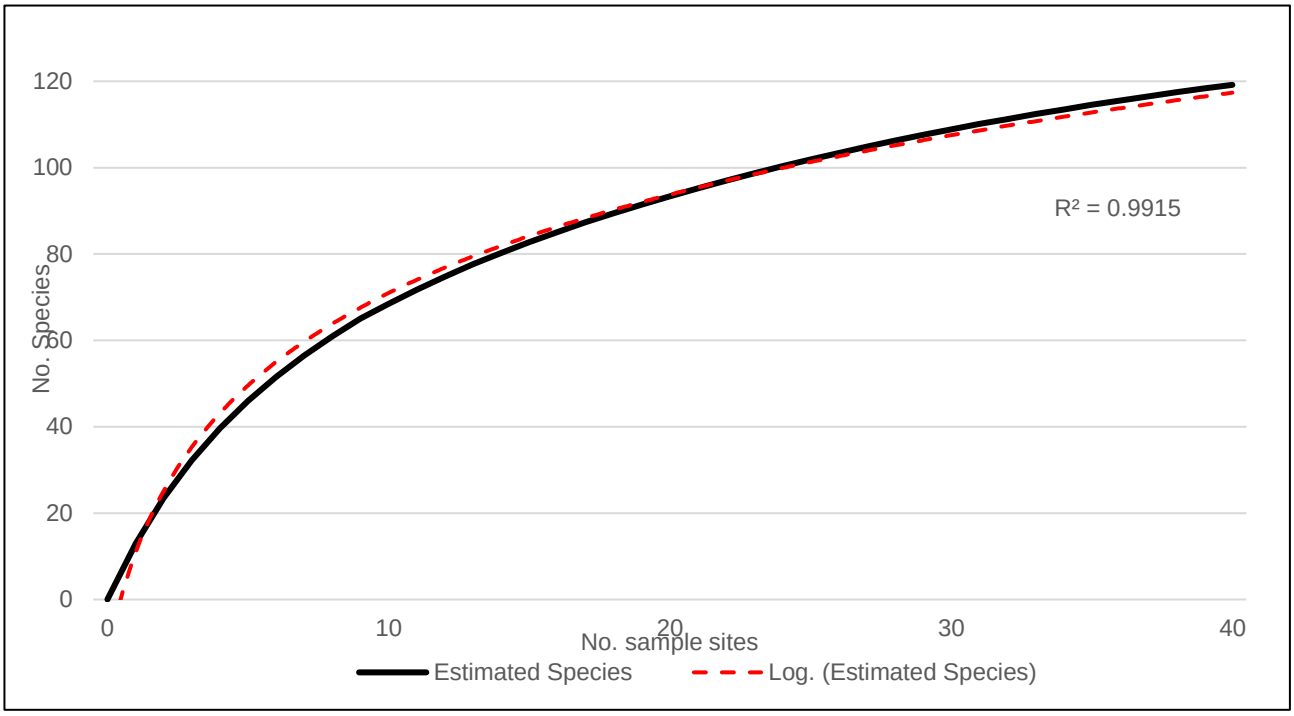


Figure 5-4: Species accumulation curve

5.2.6 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 TEC or PEC, restricted vegetation, highly disturbed vegetation, vegetation providing important refuge or significant ecological function was identified within the survey area.

5.2.7 Vegetation Condition

Based on the vegetation condition rating scale obtained from the EPA (2016a) provided in Appendix B, vegetation ranged from ‘completely degraded’ to ‘very good’ condition with the majority of vegetation in ‘good’ condition (Table 5-5Table 5-5). Disturbance in the area was from exploration activities, access tracks and grazing by large feral herbivores. A map of the vegetation condition across the survey area is provided in Figure 5-5.

Table 5-5: Vegetation condition rating within the survey area

Condition rating	Description (EPA, 2016a)	Area (ha)	Area (%)
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.	66.2	11
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.	237.4	39.6
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.	77	12.8
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.	67.7	11.3
Cleared areas	For example, wetlands, devoid of vegetation.	151.7	25.3
TOTAL		**600**	**100**

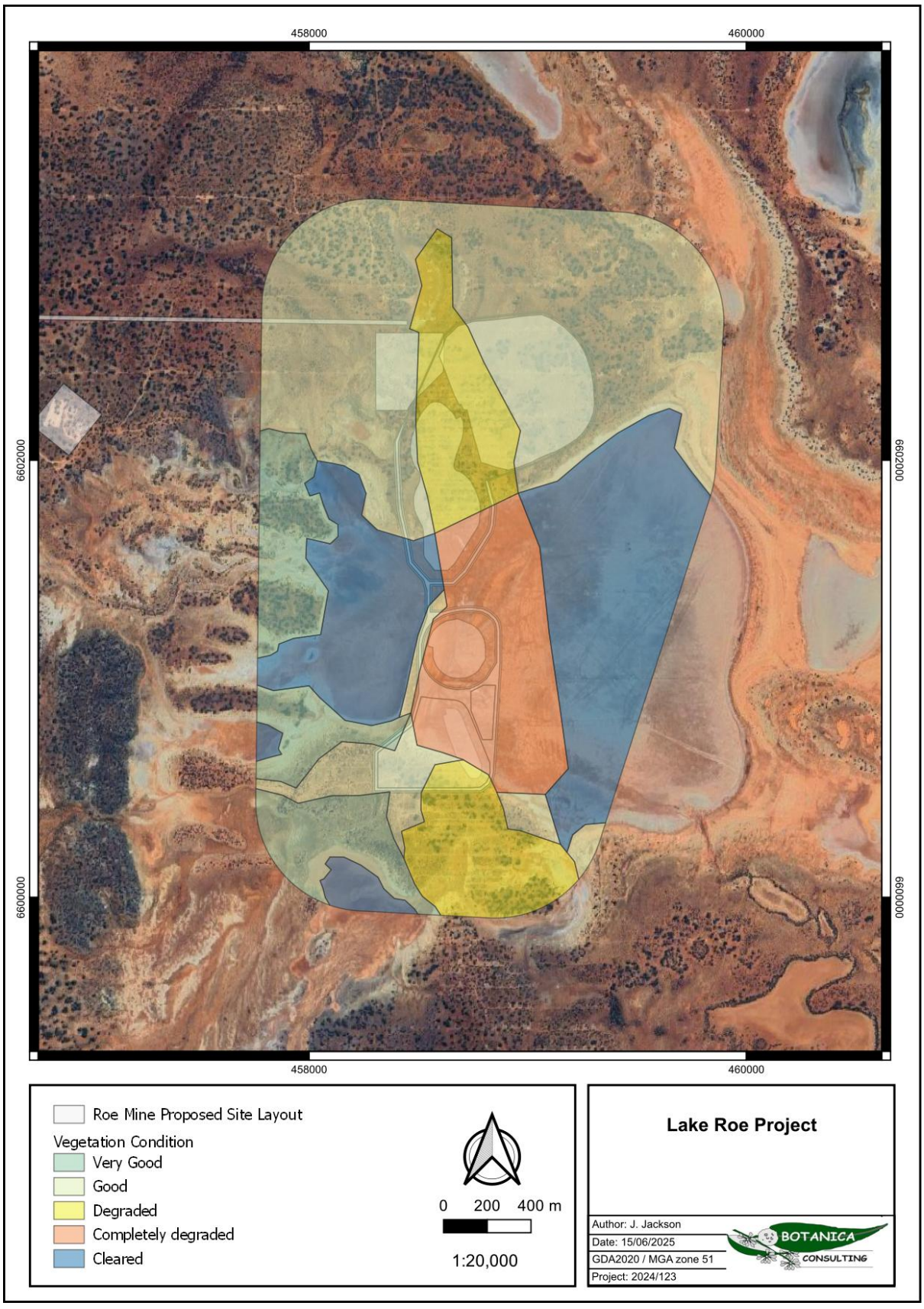


Figure 5-5: Vegetation condition rating of the survey area

5.3 Matters of National Environmental Significance

5.3.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act protects Matters of National Environmental Significance (MNES) and is used by the Commonwealth DCCEEW 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 MNES.

The EPBC Act covers 9 protected matters:

- world heritage areas
- national heritage places
- wetlands of international importance (listed under the Ramsar Convention)
- listed threatened species and ecological communities
- listed migratory species (protected under international agreements)
- Commonwealth marine areas
- Great Barrier Reef Marine Park
- nuclear actions (including uranium mines)
- water resources (that relate to unconventional gas development and large coal mining development).

No MNES as defined by the EPBC Act were identified within the survey area.

5.4 Matters of State Environmental Significance

5.4.1 *Environmental Protection Act WA 1986*

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

Under Section 51C of the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations) any clearing of native vegetation in Western Australia that is not eligible for exemption under Schedule 6 of the EP Act or under the Clearing 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”.

Environmentally sensitive areas (ESAs) are classes or areas of native vegetation as declared in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005* for the purposes of Part V Division 2 of the EP Act, where the exemptions for clearing vegetation under the Clearing Regulations do not apply.

The following areas are declared to be ESAs:

- a declared World Heritage property as defined in section 13 of the EPBC Act;
- an area that is included on the Register of the National Estate, because of its natural heritage value, under the Australian Heritage Council Act 2003 of the Commonwealth;
- a defined wetland and the area within 50 m of the wetland. Defined wetlands include Ramsar wetlands, conservation category wetlands and nationally important wetlands;
- the area covered by vegetation within 50 m of rare flora, to the extent to which the vegetation is continuous with the vegetation in which the rare flora is located;
- the area covered by a TEC;
- a Bush Forever site listed in “Bush Forever” Volumes 1 and 2 (2000), published by the Western Australia Planning Commission, except to the extent to which the site is approved to be developed by the Western Australia Planning Commission;
- the areas covered by the following policies –
    - *Environmental Protection (Gnangara Mound Crown Land) Policy 1992*;
    - *Environmental Protection (Western Swamp Tortoise Habitat) Policy 2002*;
- the areas covered by the lakes to which the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992* applies; and
- protected wetlands as defined in the *Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998*.

No ESAs declared under the EP Act were identified within the survey area.

Additionally, in accordance with Schedule 1, Clause 4 of the Clearing Regulations, clearing of native vegetation in a ‘Schedule One Area’ for mining purposes is not permitted without a clearing permit.

No Schedule One Areas occur within the survey area.

5.4.2 *Biodiversity Conservation Act 2016*

The BC Act is administered by the DBCA to conserve and protect biodiversity and to promote the ecologically sustainable use of biodiversity components in the State of Western Australia,

Under the BC Act, native species are listed as Threatened when they face a high to very high risk of extinction in the wild, and ecological communities are listed as Threatened when they face a high to very high risk of collapse.

Whilst all native flora are protected throughout the State, special protection is afforded to threatened flora and ecological communities, with the authorisation of the Minister being required before such flora can be taken or communities modified.

Furthermore, The Minister may list vegetation as a 'critical habitat' if it is critical to the survival of a threatened species or ecological community. 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 TECs, Threatened species or critical habitat listed under the BC Act were recorded within the survey area.

5.4.3 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. One Priority flora (*Calandrinia quartzitica* (P1)) was identified 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 Reserves in the survey area, the nearest gazetted Reserve is the Wallaby Rocks Timber Reserve (R1974) which is approximately 8.2 km south of the survey area.

5.5 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 5-6). The assessment found that the proposed vegetation clearing activities may be at variance with clearing principle (f).

Table 5-6: Assessment against native vegetation clearing principles

Letter	Principle	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 unlikely to be 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.	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 Pre-European vegetation associations retain >99% of their original pre-European vegetation extent.	Clearing is unlikely to be at variance with this principle
(f)	is growing, in, or in association with, an environment associated with a watercourse or wetland	No major drainage lines occur within the survey area, one minor drainage line intersects the survey area. The survey area is on the western edge of Lake Roe, this is not a DIWA wetland and is listed as a 'Non-perennial Lake' in the Surface Hydrology (Regional) data set.	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 unlikely to be 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.	There are no Reserves in the survey area, the nearest gazetted Reserve is the Wallaby Rocks Timber Reserve which is approximately 8.2 km south of the survey area.	Clearing is unlikely to be 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.	One minor drainage line occurs within the survey area. Disturbances within the survey area are not expected to cause deterioration in the quality of water on the surface or underground.	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 Goldfields subregion has an average rainfall of 200-300mm and an evaporation rate of 2400 mm. 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

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APPENDIX A:
CONSERVATION CATEGORIES (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 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 2 Division 1 of the *Biodiversity Conservation (Listing of Native Species) (Fauna) Order 2024* for critically endangered fauna or Schedule 1 Division 1 of the *Biodiversity Conservation (Listing of Native Species) (Flora) Order 2024* 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 Division 2 of the *Biodiversity Conservation (Listing of Native Species) (Fauna) Order 2024* for endangered fauna or Schedule 1 Division 2 of the *Biodiversity Conservation (Listing of Native Species) (Flora) Order 2024* 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 2 Division 3 of the *Biodiversity Conservation (Listing of Native Species) (Fauna) Order 2024* for vulnerable fauna or Schedule 1 Division 3 of the *Biodiversity Conservation (Listing of Native Species) (Flora) Order 2024* 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 3 of the *Biodiversity Conservation (Listing of Native Species) (Fauna) Order 2024* for extinct fauna or Schedule 2 the *Biodiversity Conservation (Listing of Native Species) (Flora) Order 2024* 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.	
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).

Code	Category
	Published as conservation dependent fauna under Schedule 1 Division 1 of the *Biodiversity Conservation (Listing of Native Species) (Fauna) Order 2024*.
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). 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 1 Division 2 of the *Biodiversity Conservation (Listing of Native Species) (Fauna) Order 2024*.
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 1 Division 3 of the *Biodiversity Conservation (Listing of Native Species) (Fauna) Order 2024*.
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	
EX	**Extinct**

Code	Category
	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:
	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**

Category Code	Category
	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:
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 C:
LIST OF SPECIES IDENTIFIED WITHIN EACH VEGETATION TYPE

(A) and blue shading denotes annual taxa; (P1) and red shading-denotes Priority flora (WAHERB, 1998-)

Family	Species	CLP-CW1	CLP-MW1	SCLP-EW4	OD-CS1	SD-AW1	SD-Callitris	SD-CW1	SD-MW2
Aizoaceae	*Disphyma crassifolium*				*	*		*	
Aizoaceae	*Gunniopsis quadrifida*	*				*		*	*
Amaranthaceae	*Ptilotus exaltatus (A)*			*					*
Amaranthaceae	*Ptilotus obovatus*	*				*	*		*
Amaranthaceae	*Surreya diandra*				*				
Apocynaceae	*Leichhardtia australis*					*	*		
Asteraceae	*Cratystylis conocephala*		*						
Asteraceae	*Cratystylis microphylla*	*	*	*	*	*		*	*
Asteraceae	*Cratystylis subspinescens*				*	*	*		
Asteraceae	*Olearia muelleri*	*	*	*					*
Asteraceae	*Olearia pimeleoides*	*							
Asteraceae	*Siemssenia capillaris (A)*			*	*	*			
Asteraceae	*Vittadinia eremaea (A)*					*			
Casuarinaceae	*Casuarina pauper*	*						*	
Chenopodiaceae	*Atriplex codonocarpa (A)*				*			*	
Chenopodiaceae	*Atriplex holocarpa*				*				
Chenopodiaceae	*Atriplex lindleyi*				*				
Chenopodiaceae	*Atriplex stipitata*				*				*
Chenopodiaceae	*Atriplex vesicaria*				*				
Chenopodiaceae	*Dissocarpus paradoxus*			*	*				
Chenopodiaceae	*Einadia nutans*								*
Chenopodiaceae	*Enchylaena tomentosa*			*		*	*	*	*
Chenopodiaceae	*Maireana amoena*				*	*		*	
Chenopodiaceae	*Maireana carnosa*							*	
Chenopodiaceae	*Maireana convexa*	*			*				
Chenopodiaceae	*Maireana eriosphaera*				*				
Chenopodiaceae	*Maireana georgei*					*			
Chenopodiaceae	*Maireana glomerifolia*				*				
Chenopodiaceae	*Maireana pentagona*								*
Chenopodiaceae	*Maireana pentatropis*								*
Chenopodiaceae	*Maireana sedifolia*	*					*		*
Chenopodiaceae	*Maireana thesioides*				*	*	*	*	*
Chenopodiaceae	*Maireana tomentosa*				*				
Chenopodiaceae	*Maireana triptera*			*					
Chenopodiaceae	*Rhagodia drummondii*						*		*
Chenopodiaceae	*Rhagodia eremaea*			*	*	*		*	*
Chenopodiaceae	*Sclerolaena cuneata*				*				
Chenopodiaceae	*Sclerolaena diacantha*	*			*				
Chenopodiaceae	*Sclerolaena parviflora*			*					
Chenopodiaceae	*Sclerolaena uniflora*				*	*	*		*
Chenopodiaceae	*Tecticornia doliiformis*				*				
Chenopodiaceae	*Tecticornia indica*				*				
Chenopodiaceae	*Tecticornia lylei*				*				
Chenopodiaceae	*Tecticornia pergranulata*				*			*	
Chenopodiaceae	*Tecticornia* sp. Dennys Crossing (K.A. Shepherd & J. English KS552)				*				
Chenopodiaceae	*Tecticornia* sp. Roe 1								
Chenopodiaceae	*Tecticornia* sp. Roe 2				*				
Cupressaceae	*Callitris preissii*						*		

Family	Species	CLP-CW1	CLP-MW1	SCLP-EW4	OD-CS1	SD-AW1	SD-Callitris	SD-CW1	SD-MW2
Fabaceae	*Acacia caesaneura*					*			
Fabaceae	*Acacia hemiteles*	*							
Fabaceae	*Acacia kalgoorliensis*	*						*	
Fabaceae	*Acacia ramulosa*					*			
Fabaceae	*Senna artemisioides* subsp. *filifolia*	*	*	*					
Frankeniaceae	*Frankenia cinerea*				*				
Frankeniaceae	*Frankenia interioris*				*			*	
Frankeniaceae	*Frankenia pauciflora*				*				
Frankeniaceae	*Frankenia setosa*				*				
Goodeniaceae	*Scaevola spinescens*	*	*					*	*
Hemerocallidaceae	*Dianella revoluta*			*		*		*	*
Malvaceae	*Lawrencia repens*				*				
Malvaceae	*Lawrencia squamata*				*				
Malvaceae	*Sida calyxhymenia*						*		
Montiaceae	*Calandrinia eremaea (A)*				*				
Montiaceae	*Calandrinia quartzitica (A)(P1)*				*				
Myrtaceae	*Darwinia* sp. Karonie				*				
Myrtaceae	*Eucalyptus celastroides*			*					
Myrtaceae	*Eucalyptus horistes*								*
Myrtaceae	*Eucalyptus oleosa*		*	*					
Myrtaceae	*Melaleuca hamata*				*				
Myrtaceae	*Melaleuca halmaturorum*				*				
Pittosporaceae	*Pittosporum angustifolium*	*							*
Poaceae	*Aristida contorta (A)*		*			*			
Poaceae	*Austrostipa elegantissima*	*	*	*	*			*	
Poaceae	*Enneapogon caerulescens (A)*					*	*		
Poaceae	*Eragrostis dielsii (A)*				*	*		*	*
Poaceae	*Eragrostis eriopoda*					*	*		
Poaceae	*Monachather paradoxus*					*	*		*
Poaceae	*Triodia scariosa*	*		*	*		*		*
Proteaceae	*Hakea preissii*					*			
Santalaceae	*Exocarpos aphyllus*	*	*						
Sapindaceae	*Alectryon oleifolius*						*		
Sapindaceae	*Dodonaea lobulata*	*							
Sapindaceae	*Dodonaea viscosa*					*	*	*	*
Sapindaceae	*Dodonaea viscosa* subsp. *angustissima*	*							
Scrophulariaceae	*Eremophila caperata*			*					
Scrophulariaceae	*Eremophila decipiens*	*		*					*
Scrophulariaceae	*Eremophila decipiens* subsp. *decipiens*	*							
Scrophulariaceae	*Eremophila miniata*					*	*	*	*
Scrophulariaceae	*Eremophila parvifolia*		*						
Scrophulariaceae	*Eremophila scoparia*	*	*	*	*	*			*
Solanaceae	*Lycium australe*			*			*		
Solanaceae	*Solanum lachnophyllum*								*
Solanaceae	*Solanum lasiophyllum*					*		*	
Solanaceae	*Solanum nummularium*	*	*			*		*	

APPENDIX D:
QUADRAT LOCATIONS (NW CORNER-GDA2020)

Quadrat	Easting	Northing
Q1	459806.2	6602756
Q2	459189.9	6603122
Q3	458045	6602258
Q4	458850.4	6602758
Q5	458065.4	6603130
Q6	458564.4	6602482
Q7	458066.3	6602773
Q8	457968.3	6600501
Q9	458534.6	6600539
Q10	458438.1	6600835
Q11	458507.7	6601078
Q12	458565.3	6601305
Q13	458888.3	6600392
Q14	459045	6600072
Q15	458644.5	6599982
Q16	458387.7	6600193
Q17	458018.6	6600201
Q18	457794.2	6601146
Q19	458342.5	6602208
Q20 (BQ25)	459431.3	6602453
Q21 (BQ26)	458511	6601892
Q22 (BQ27)	458587.3	6603127

APPENDIX E:
QUADRAT DATASHEETS

Project Name: Lake Roe		
Date: 12/03/25	**Botanist:** JJ & KB	**Photo number (NW corner):** 697-699
Quadrat No: Q1	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 3695
Coordinates (GDA2020): 459806.2E; 6602756N		**Elevation (m):** 320.2m
Aspect: East	**Fire (yrs):** Long Unburnt	**Condition rating:** Very Good
Landform: Open Depression		
Coarse fragments on the surface: Nil		
Rock outcrop (abundance/runoff): Nil / Slow		
Soil (profile/field texture/soil surface): Orange / Sandy Clay Loam / Soft		
Cover leaf litter: 5%		
Cover bare ground: 85%		
Upper stratum	**Mid-stratum**	**Lower stratum**
	Growth form: Chenopod Shrub	**Growth form:** Sod Grass
	Height: 0.5-1m	**Height:** <0.25m
	Crown cover: 30-70%	**Crown cover:** <10%
	Dominant taxa:	**Dominant taxa:**
	Tecticornia indica	*Eragrostis dielsii*

ALL TAXA
Eragrostis dielsii (A)
Frankenia setosa
Maireana amoena
Disphyma crassifolium
Siemssenia capillaris
Tecticornia indica
Tecticornia pergranulata
Tecticornia sp. Dennys Crossing (K.A. Shepherd & J. English KS552)
Tecticornia sp. Roe 2

Project Name: Lake Roe		
Date: 12/03/25	**Botanist:** JJ & KB	**Photo number (NW corner):** 704-706
Quadrat No: Q2	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 3704
Coordinates (GDA2020): 459189.9E; 6603122N		**Elevation (m):** 311.8m
Aspect: South	**Fire (yrs):** Long Unburnt	**Condition rating:** Very Good
Landform: Flat / Plain		
Coarse fragments on the surface: Nil		
Rock outcrop (abundance/runoff): Nil / Very Slow		
Soil (profile/field texture/soil surface): Orange / Uniform / Sandy Clay Loam / Soft		
Cover leaf litter: 50%		
Cover bare ground: 40%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Shrub Mallee (<8m)	**Growth form:** Shrub	**Growth form:** Hummock Grass
Height: 6-12m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** 30-70%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Eucalyptus oleosa	*Cratystylis microphylla*	*Triodia scariosa*

ALL TAXA
Cratystylis microphylla
Dianella revoluta
Eremophila caperata
Eucalyptus celastroides
Eucalyptus oleosa
Triodia scariosa

Project Name: Lake Roe		
Date: 12/03/25	**Botanist:** JJ	**Photo number (NW corner):** 710-712
Quadrat No: Q3	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 3709
Coordinates (GDA2020): 458045E; 6602258N		**Elevation (m):** 308.7m
Aspect: South East	**Fire (yrs):** Long Unburnt	**Condition rating:** Very Good
Landform: Open Depression / Drainage Depression		
Coarse fragments on the surface: <2% / 6-20mm / Subangular		
Rock outcrop (abundance/runoff): Nil / Very Slow		
Soil (profile/field texture/soil surface): Orange / Uniform / Sandy Clay Loam / Soft		
Cover leaf litter: 5%		
Cover bare ground: 85%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Absent	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
	Height: 0.5-1m	**Height:** 0.25-0.5m
	Crown cover: 10-30%	**Crown cover:** 30-70%
	Dominant taxa:	**Dominant taxa:**
	Cratystylis subspinescens	*Maireana glomerifolia*

ALL TAXA
Austrostipa elegantissima
Calandrinia eremaea (A)
Cratystylis microphylla
Cratystylis subspinescens
Disphyma crassifolium
Eragrostis dielsii (A)
Eremophila miniata
Eremophila scoparia
Frankenia cinerea
Frankenia setosa
Maireana amoena
Maireana georgei
Maireana glomerifolia
Scaevola spinescens
Tecticornia doliiformis
Tecticornia sp. Roe 1

Project Name: Lake Roe		
Date: 12/03/25	**Botanist:** JJ	**Photo number (NW corner):** 716-718
Quadrat No: Q4	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 3715
Coordinates (GDA2020): 458850.4E; 6602758N		**Elevation (m):** 307.9m
Aspect: South West	**Fire (yrs):** Long Unburnt	**Condition rating:** Very Good
Landform: Open Depression / Drainage Depression		
Coarse fragments on the surface: <2% / 2-6mm / Subangular		
Rock outcrop (abundance/runoff): Nil / Very Slow		
Soil (profile/field texture/soil surface): Orange / Uniform / Sandy Clay Loam / Soft		
Cover leaf litter: 10%		
Cover bare ground: 80%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Absent	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
	Height: 1-3m	**Height:** 0.25-0.5m
	Crown cover: 30-70%	**Crown cover:** 10-30%
	Dominant taxa:	**Dominant taxa:**
	Cratystylis subspinescens	*Atriplex vesicaria*

ALL TAXA
Atriplex vesicaria
Austrostipa elegantissima
Calandrinia quartzitica (P1) (A)
Cratystylis subspinescens
Disphyma crassifolium
Dissocarpus paradoxus
Eragrostis dielsii (A)
Frankenia cinerea
Maireana amoena
Maireana glomerifolia
Sclerolaena diacantha
Siemssenia capillaris (A)
Surreya diandra

Project Name: Lake Roe		
Date: 12/03/25	**Botanist:** JJ	**Photo number (NW corner):** 724-726
Quadrat No: Q5	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 3720
Coordinates (GDA2020): 458065.4E; 6603130N		**Elevation (m):** 314.6m
Aspect: West	**Fire (yrs):** Long Unburnt	**Condition rating:** Very Good
Landform: Flat / Plain		
Coarse fragments on the surface: 10-20% / 6-20mm / Subrounded		
Rock outcrop (abundance/runoff): Nil / Very Slow		
Soil (profile/field texture/soil surface): Brown / Uniform / Clay Loam / Firm / Surface Crust		
Cover leaf litter: 40%		
Cover bare ground: 50%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree Mallee (>8m)	**Growth form:** Shrub	**Growth form:** Shrub
Height: 6-12m	**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:**
Eucalyptus oleosa	*Cratystylis conocephala*	*Olearia muelleri*

ALL TAXA
Aristida contorta (A)
Austrostipa elegantissima
Cratystylis microphylla
Cratystylis conocephala
Eremophila parvifolia
Eremophila scoparia
Eucalyptus oleosa
Exocarpos aphyllus
Olearia muelleri
Scaevola spinescens
Senna artemisioides subsp. *filifolia*
Solanum nummularium

Project Name: Lake Roe		
Date: 13/03/25	**Botanist:** JJ & JW	**Photo number (NW corner):** 727-729
Quadrat No: Q6	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 3724
Coordinates (GDA2020): 458464.4E; 6602482N		**Elevation (m):** 304.3m
Aspect: South	**Fire (yrs):** Long Unburnt	**Condition rating:** Very Good
Landform: Open Depression		
Coarse fragments on the surface: <2% / 2-6mm / Subangular		
Rock outcrop (abundance/runoff): Nil / Slow		
Soil (profile/field texture/soil surface): Brown / Uniform / Sandy Clay Loam / Firm		
Cover leaf litter: 10%		
Cover bare ground: 80%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Absent	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
	Height: 1-3m	**Height:** 0.5-1m
	Crown cover:10-30%	**Crown cover:** 30-70%
	Dominant taxa:	**Dominant taxa:**
	Melaleuca halmaturorum	*Tecticornia doliiformis*

ALL TAXA
Atriplex codonocarpa (A)
Atriplex lindleyi
Darwinia sp. Karonie
Disphyma crassifolium
Eragrostis dielsii (A)
Frankenia setosa
Maireana amoena
Melaleuca halmaturorum
Surreya diandra
Tecticornia doliiformis
Tecticornia lylei

Project Name: Lake Roe		
Date: 13/03/25	**Botanist:** JJ & JW	**Photo number (NW corner):** 733-735
Quadrat No: Q7	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 3728
Coordinates (GDA2020): 458066.3E; 6602773N		**Elevation (m):** 309.3m
Aspect: South	**Fire (yrs):** Long Unburnt	**Condition rating:** Very Good
Landform: Flat / Plain		
Coarse fragments on the surface: <2% / 2-6mm / Subangular		
Rock outcrop (abundance/runoff): Nil / Very Slow		
Soil (profile/field texture/soil surface): Red-Brown / Uniform / Clay Loam / Firm / Surface Crust		
Cover leaf litter: 35%		
Cover bare ground: 55%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 6-12m	**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:**
Casuarina pauper	*Scaevola spinescens*	*Ptilotus obovatus*

ALL TAXA
Acacia hemiteles
Casuarina pauper
Dodonaea lobulata
Eremophila decipiens
Eremophila scoparia
Exocarpos aphyllus
Maireana sedifolia
Ptilotus obovatus
Scaevola spinescens
Sclerolaena diacantha

Project Name: Lake Roe		
Date: 30/04/25	**Botanist:** JJ & JW	**Photo number (NW corner):** 93-95
Quadrat No: Q8	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 2576
Coordinates (GDA2020): 457968.3E; 6600501N		**Elevation (m):** 450.1m
Aspect: South	**Fire (yrs):** Long Unburnt	**Condition rating:** Very Good
Landform: Mid Slop / Dune / No Effective Disturbance Except Grazing		
Coarse fragments on the surface: Nil		
Rock outcrop (abundance/runoff): Nil / Slow		
Soil (profile/field texture/soil surface): Orange Red / Uniform / Sand / Soft / Surface Crust		
Cover leaf litter: 35%		
Cover bare ground: 50%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Hummock Grass
Height: 6-12m	**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 ramulosa	*Rhagodia eremaea*	*Ptilotus obovatus*

ALL TAXA
Acacia ramulosa
Aristida contorta (A)
Cratystylis subspinescens
Dianella revoluta
Disphyma crassifolium
Enchylaena tomentosa
Enneapogon caerulescens (A)
Eragrostis dielsii (A)
Eremophila miniata
Gunniopsis quadrifida
Leichhardtia australis
Maireana amoena
Maireana thesioides
Monachather paradoxus
Ptilotus obovatus
Rhagodia eremaea
Siemssenia capillaris (A)
Solanum lasiophyllum
Solanum nummularium
Vittadinia eremaea (A)

Project Name: Lake Roe		
Date: 30/04/25	**Botanist:** JJ & JW	**Photo number (NW corner):** 96-98
Quadrat No: Q9	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 2582
Coordinates (GDA2020): 458534.6E; 6600539N		**Elevation (m):** 453.2m
Aspect: South	**Fire (yrs):** Long Unburnt	**Condition rating:** Very Good
Landform: Flat / Plain		
Coarse fragments on the surface: Nil		
Rock outcrop (abundance/runoff): Nil / Very Slow		
Soil (profile/field texture/soil surface): Orange Red / Uniform / Sand / Sandy Loam / Soft / Surface Crust		
Cover leaf litter: 45%		
Cover bare ground: 40%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Hummock Grass
Height: 6-12m	**Height:** 1-3m	**Height:** 0.25-0.5m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** 30-70%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Eucalyptus horistes	*Eremophila scoparia*	*Triodia irritans*

ALL TAXA
Enchylaena tomentosa
Eremophila miniata
Eremophila scoparia
Eucalyptus horistes
Maireana pentatropis
Maireana sedifolia
Maireana thesioides
Monachather paradoxus
Olearia muelleri
Pittosporum angustifolium
Ptilotus obovatus
Rhagodia drummondii
Sclerolaena uniflora
Solanum lachnophyllum
Triodia irritans

Project Name: Lake Roe		
Date: 30/04/25	**Botanist:** JJ & KB	**Photo number (NW corner):** 99-101
Quadrat No: Q10	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 2586
Coordinates (GDA2020): 458438.1E; 6600835N		**Elevation (m):** 450.7m
Aspect: West	**Fire (yrs):** Long Unburnt	**Condition rating:** Very Good
Landform: Open Depression		
Coarse fragments on the surface: 2-10% / 6-20mm / Subangular / Quartz		
Rock outcrop (abundance/runoff): Nil / Slow		
Soil (profile/field texture/soil surface): Light Brown / Uniform / Clay Loam / Soft / Cracking		
Cover leaf litter: 5%		
Cover bare ground: 70%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Absent	**Absent**	**Growth form:** Chenopod Grass
		Height: 0.5-1m
		Crown cover: 30-70%
		Dominant taxa:
		Tecticornia indica & *Tecticornia pergranulata*

ALL TAXA
Atriplex holocarpa (A)
Atriplex vesicaria
Disphyma crassifolium
Eragrostis dielsii (A)
Frankenia interioris
Maireana amoena
Sclerolaena cuneata
Tecticornia indica
Tecticornia pergranulata

Project Name: Lake Roe		
Date: 30/04/25	**Botanist:** JJ & JW	**Photo number (NW corner):** 103-105
Quadrat No: Q11	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 2590
Coordinates (GDA2020): 458508.7E; 6601078N		**Elevation (m):** 449.7m
Aspect: West	**Fire (yrs):** Long Unburnt	**Condition rating:** Good
Landform: Mid Slope / Duneslope		
Coarse fragments on the surface: 2-10% / 6-20mm / Subangular / Quartz		
Rock outcrop (abundance/runoff): Nil / Slow		
Soil (profile/field texture/soil surface): Light Brown / Uniform / Clay Loam / Soft / Cracking		
Cover leaf litter: 5%		
Cover bare ground: 70%		

Upper stratum	Mid-stratum	Lower stratum
Absent	**Absent**	**Growth form:** Chenopod Shrub
		Height: 0.5-1m
		Crown cover: 30-70%
		Dominant taxa:
		Tecticornia indica & Tecticornia pergranulata

ALL TAXA
Atriplex vesicaria
Disphyma crassifolium
Eragrostis dielsii (A)
Frankenia interioris
Lawrencia squamata
Maireana amoena
Maireana glomerifolia
Maireana tomentosa
Tecticornia indica
Tecticornia pergranulata

Project Name: Lake Roe		
Date: 30/04/25	**Botanist:** JJ & JW	**Photo number (NW corner):** 106-108
Quadrat No: Q12	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 2594
Coordinates (GDA2020): 458565.3E; 6601305N		**Elevation (m):** 451.4m
Aspect: West	**Fire (yrs):** Long Unburnt	**Condition rating:** Good
Landform: Mid Slope / Duneslope		
Coarse fragments on the surface: 2-10% / 6-20mm / Subangular / Quartz		
Rock outcrop (abundance/runoff): Nil / Slow		
Soil (profile/field texture/soil surface): Light Brown / Uniform / Clay Loam / Soft / Surface Crust		
Cover leaf litter: 5%		
Cover bare ground: 70%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Absent	**Absent**	**Growth form:** Chenopod Shrub
		Height: 0.5-1m
		Crown cover: 30-70%
		Dominant taxa:
		Tecticornia indica & Tecticornia pergranulata

ALL TAXA
Atriplex stipitata
Atriplex vesicaria
Disphyma crassifolium
Eragrostis dielsii (A)
Frankenia interioris
Lawrencia squamata
Maireana eriosphaera
Maireana glomerifolia
Tecticornia indica
Tecticornia pergranulata

Project Name: Lake Roe		
Date: 30/04/25	**Botanist:** JJ & JW	**Photo number (NW corner):** 111-113
Quadrat No: Q13	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 2599
Coordinates (GDA2020): 458888.3E; 6600392N		**Elevation (m):** 455.7m
Aspect: North	**Fire (yrs):** Long Unburnt	**Condition rating:** Good
Landform: Mid Slope / Duneslope		
Coarse fragments on the surface: Nil		
Rock outcrop (abundance/runoff): Nil / Slow		
Soil (profile/field texture/soil surface): Orange / Uniform / Sand / Soft		
Cover leaf litter: 25%		
Cover bare ground: 65%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Hummock Grass
Height: 6-12m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** 30-70%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Callitris preissii	*Dodonaea viscosa*	*Triodia scariosa*

ALL TAXA
Alectryon oleifolius
Callitris preissii
Cratystylis subspinescens
Dodonaea viscosa
Enchylaena tomentosa
Enneapogon caerulescens (A)
Eragrostis eriopoda
Eremophila miniata
Leichhardtia australis
Lycium australe
Maireana thesioides
Maireana sedifolia
Monachather paradoxus
Ptilotus obovatus
Rhagodia drummondii
Sclerolaena uniflora
Sida calyxhymenia
Triodia scariosa

Project Name: Lake Roe		
Date: 30/04/25	**Botanist:** JJ & JW	**Photo number (NW corner):** 114-116
Quadrat No: Q14	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 2603
Coordinates (GDA2020): 459045E; 6600072N		**Elevation (m):** 454.2m
Aspect: South East	**Fire (yrs):** Long Unburnt	**Condition rating:** Good
Landform: Dune / Duneslope		
Coarse fragments on the surface: Nil		
Rock outcrop (abundance/runoff): Nil / Slow		
Soil (profile/field texture/soil surface): Orange / Uniform / Sand / Soft		
Cover leaf litter: 40%		
Cover bare ground: 50%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Hummock Grass
Height: 6-12m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: 30-70%	**Crown cover:** 30-70%	**Crown cover:** 30-70%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Eucalyptus horistes	*Cratystylis microphylla*	*Triodia scariosa*

ALL TAXA
Atriplex stipitata
Cratystylis microphylla
Dianella revoluta
Einadia nutans
Eragrostis dielsii (A)
Eremophila decipiens
Eucalyptus horistes
Gunniopsis quadrifida
Maireana pentagona
Pittosporum angustifolium
Ptilotus exaltatus (A)
Rhagodia eremaea
Scaevola spinescens
Sclerolaena uniflora
Triodia scariosa

Project Name: Lake Roe		
Date: 30/04/25	**Botanist:** JJ & JW	**Photo number (NW corner):** 117-119
Quadrat No: Q15	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 2607
Coordinates (GDA2020): 458644.5E; 6599982N		**Elevation (m):** 454.4m
Aspect: South East	**Fire (yrs):** Long Unburnt	**Condition rating:** Good
Landform: Mid Slope / Duneslope		
Coarse fragments on the surface: 20-50% / 6-20mm / Subangular / Quartz		
Rock outcrop (abundance/runoff): Nil / Very Slow		
Soil (profile/field texture/soil surface): Light Brown / Uniform / Clay Loam / Firm		
Cover leaf litter: 25%		
Cover bare ground: 65%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 6-12m	**Height:** 1-3m	**Height:** 1-3m
Crown cover: 10-30%	**Crown cover:** 10-30%	**Crown cover:** 10-30%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Casuarina pauper	*Acacia kalgoorliensis*	*Cratystylis microphylla*

ALL TAXA
Acacia kalgoorliensis
Atriplex codonocarpa (A)
Austrostipa elegantissima
Casuarina pauper
Cratystylis microphylla
Dianella revoluta
Disphyma crassifolium
Dodonaea viscosa
Enchylaena tomentosa
Eragrostis dielsii (A)
Eremophila miniata
Frankenia interioris
Gunniopsis quadrifida
Maireana amoena
Maireana carnosa
Maireana thesioides
Rhagodia eremaea
Scaevola spinescens
Solanum lasiophyllum
Solanum nummularium
Tecticornia pergranulata

Project Name: Lake Roe		
Date: 30/04/25	**Botanist:** JJ & JW	**Photo number (NW corner):** 121-123
Quadrat No: Q16	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 2611
Coordinates (GDA2020): 458387.7E; 6600193N		**Elevation (m):** 458.2m
Aspect: South	**Fire (yrs):** Long Unburnt	**Condition rating:** Good
Landform: Mid Slope / Duneslope		
Coarse fragments on the surface: Nil		
Rock outcrop (abundance/runoff): Nil / Very Slow		
Soil (profile/field texture/soil surface): Orange / Uniform / Sand / Soft		
Cover leaf litter: 40%		
Cover bare ground: 50%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
Height: 6-12m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** 30-70%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Acacia caesaneura	*Cratystylis microphylla*	*Rhagodia eremaea*

ALL TAXA
Acacia caesaneura
Aristida contorta (A)
Cratystylis microphylla
Dodonaea viscosa
Enneapogon caerulescens (A)
Eragrostis eriopoda
Eragrostis dielsii (A)
Eremophila miniata
Eremophila scoparia
Gunniopsis quadrifida
Hakea preissii
Maireana thesioides
Maireana georgei
Monachather paradoxus
Ptilotus obovatus
Rhagodia eremaea
Sclerolaena uniflora
Siemssenia capillaris (A)
Solanum lasiophyllum

Project Name: Lake Roe		
Date: 30/04/25	**Botanist:** JJ & JW	**Photo number (NW corner):** 124-126
Quadrat No: Q17	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 2615
Coordinates (GDA2020): 458018.6E; 6600201N		**Elevation (m):** 460m
Aspect: South	**Fire (yrs):** Long Unburnt	**Condition rating:** Very Good
Landform: Duneslope		
Coarse fragments on the surface: Nil		
Rock outcrop (abundance/runoff): Nil / Very Slow		
Soil (profile/field texture/soil surface): Orange / Uniform / Clay Loam / Soft / Surface Crust		
Cover leaf litter: 50%		
Cover bare ground: 35%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Absent	**Growth form:** Shrub	**Growth form:** Chenopod Shrub
	Height: 1-3m	**Height:** 0.5-1m
	Crown cover: <1%	**Crown cover:** 30-70%
	Dominant taxa:	**Dominant taxa:**
	Eremophila scoparia	*Tecticornia doliiformis* & *Tecticornia indica*

ALL TAXA
Atriplex vesicaria
Disphyma crassifolium
Eragrostis dielsii (A)
Eremophila scoparia
Frankenia interioris
Maireana amoena
Maireana tomentosa
Sclerolaena uniflora
Tecticornia doliiformis
Tecticornia indica

Project Name: Lake Roe		
Date: 30/04/25	**Botanist:** JJ & JW	**Photo number (NW corner):** 127-129
Quadrat No: Q18	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 2621
Coordinates (GDA2020): 457794.2E; 6601146N		**Elevation (m):** 461.8m
Aspect: East	**Fire (yrs):** Long Unburnt	**Condition rating:** Very Good
Landform: Upper Slope / Dunecrest / No Effective Disturbance Except Grazing		
Coarse fragments on the surface: Nil		
Rock outcrop (abundance/runoff): Nil / Slow		
Soil (profile/field texture/soil surface): Orange / Uniform / Sand Soft		
Cover leaf litter: 50%		
Cover bare ground: 40%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Hummock Grass
Height: 6-12m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: 10-30%	**Crown cover:** <10%	**Crown cover:** 30-70%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Eucalyptus horistes	*Dodonaea viscosa*	*Triodia scariosa*

ALL TAXA
Dianella revoluta
Dodonaea viscosa
Enchylaena tomentosa
Eucalyptus horistes
Pittosporum angustifolium
Rhagodia eremaea
Scaevola spinescens
Triodia scariosa

Project Name: Lake Roe		
Date: 30/04/25	**Botanist:** JJ & JW	**Photo number (NW corner):** 141-143
Quadrat No: Q19	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 2628
Coordinates (GDA2020): 458342.5E; 6602208N		**Elevation (m):** 468.6m
Aspect: South West	**Fire (yrs):** Long Unburnt	**Condition rating:** Good
Landform: Flat / Open Depression		
Coarse fragments on the surface: 50-90% / 6-20mm / Subangular		
Rock outcrop (abundance/runoff): Nil / Slow		
Soil (profile/field texture/soil surface): Light Brown / Uniform / Sandy Clay Loam / Soft		
Cover leaf litter: 30%		
Cover bare ground: 60%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Shrub	**Growth form:** Shrub	**Growth form:** Hummock Grass
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:**
Melaleuca hamata	*Cratystylis microphylla*	*Triodia scariosa*

ALL TAXA
Cratystylis microphylla
Maireana glomerifolia
Lawrencia repens
Melaleuca hamata
Melaleuca halmaturorum
Rhagodia eremaea
Triodia scariosa

Project Name: Lake Roe		
Date: 12/03/25	**Botanist:** JJ & KB	**Photo number (NW corner):** 701-703
Quadrat No: 20 (BQ25)	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 3700
Coordinates (GDA2020): 459431.3E; 6602453N		**Elevation (m):** 318.9m
Aspect: East	**Fire (yrs):** Long Unburnt	**Condition rating:** Very Good
Landform: Flat / Plain		
Coarse fragments on the surface: Nil		
Rock outcrop (abundance/runoff): Nil / Very Slow		
Soil (profile/field texture/soil surface): Orange / Sandy Clay Loam		
Cover leaf litter: 30%		
Cover bare ground: 60%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Shrub Mallee (<8m)	**Growth form:** Shrub	**Growth form:** Hummock Grass
Height: 6-12m	**Height:** 1-3m	**Height:** 0.5-1m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** 30-70%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Eucalyptus oleosa	*Cratystylis microphylla*	*Triodia scariosa*

ALL TAXA
Austrostipa elegantissima
Cratystylis microphylla
Dissocarpus paradoxus
Enchylaena tomentosa
Eremophila caperata
Eremophila decipiens
Eremophila scoparia
Eucalyptus oleosa
Lycium australe
Maireana triptera
Olearia muelleri
Ptilotus exaltatus (A)
Rhagodia eremaea
Sclerolaena parviflora
Senna artemisioides subsp. *filifolia*
Siemssenia capillaris (A)
Triodia scariosa

Project Name: Lake Roe		
Date: 12/03/25	**Botanist:** JJ & KB	**Photo number (NW corner):** 690-692
Quadrat No: 21 (BQ26)	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 3692
Coordinates (GDA2020): 458511E; 6601892N		**Elevation (m):** 325.9m
Aspect: West	**Fire (yrs):** Long Unburnt	**Condition rating:** Very Good
Landform: Open Depression / Drainage Depression		
Coarse fragments on the surface: Nil		
Rock outcrop (abundance/runoff): Nil / Very Slow		
Soil (profile/field texture/soil surface): Orange-Brown / Sandy Loam		
Cover leaf litter: 10%		
Cover bare ground: 90%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Absent	**Growth form:** Shrub	**Growth form:** Chenopod shrub
	Height: 1-3 m	**Height:** 0.5 m
	Crown cover:30-70 %	**Crown cover:** <10%
	Dominant taxa:	**Dominant taxa:**
	Cratystylis subspinescens	*Maireana amoena*
ALL TAXA		
Atriplex vesicaria		
Austrostipa elegantissima		
Carpobrotus modestus		
Cratystylis subspinescens		
Eragrostis dielsii (A)		
Frankenia pauciflora		
Frankenia setosa		
Maireana amoena		
Maireana convexa		
Rhagodia eremaea		
Surreya diandra		

Project Name: Lake Roe		
Date: 12/03/25	**Botanist:** JJ & KB	**Photo number (NW corner):** 707-709
Quadrat No: 22 (BQ27)	**Quadrat size/shape:** 20m x 20m/Square	**Waypoint:** 3708
Coordinates (GDA2020): 458587.3E; 6603127N		**Elevation (m):** 302.6m
Aspect: Northwest	**Fire (yrs):** Long Unburnt	**Condition rating:** Very Good
Landform: Flat / Plain		
Coarse fragments on the surface: Nil		
Rock outcrop (abundance/runoff): Nil / Very Slow		
Soil (profile/field texture/soil surface): Orange / Sandy Clay Loam		
Cover leaf litter: 40%		
Cover bare ground: 50%		
Upper stratum	**Mid-stratum**	**Lower stratum**
Growth form: Tree	**Growth form:** Shrub	**Growth form:** Shrub
Height: 6-12m	**Height:** 1-3 m	**Height:** <0.5 m
Crown cover: 30-70%	**Crown cover:** 10-30%	**Crown cover:** <10%
Dominant taxa:	**Dominant taxa:**	**Dominant taxa:**
Casuarina pauper	*Cratystylis microphylla*	*Ptilotus obovatus*

ALL TAXA
Acacia kalgoorliensis
Austrostipa elegantissima
Casuarina pauper
Cratystylis microphylla
Dodonaea viscosa subsp. *angustissima*
Eremophila decipiens subsp. *decipiens*
Eremophila scoparia
Gunniopsis quadrifida
Maireana convexa
Maireana sedifolia
Olearia muelleri
Olearia pimeleoides
Pittosporum angustifolium
Ptilotus obovatus
Senna artemisioides subsp. *filifolia*
Solanum nummularium
Triodia scariosa

APPENDIX F:
QUADRAT PHOTOGRAPHS

Q1			
Direction	East	South-East	South
Q2			
Direction	East	South-East	South

Q3			
Direction	**East**	**South-East**	**South**
Q4			
Direction	**East**	**South-East**	**South**

Q5			
Direction	**East**	**South-East**	**South**
Q6			
Direction	**East**	**South-East**	**South**

Q7			
Direction	**East**	**South-East**	**South**
BQ25			
Direction	**East**	**South-East**	**South**

BQ26			
Direction	**East**	**South-East**	**South**
BQ27			
Direction	**East**	**South-East**	**South**

Q8			
Direction	**East**	**South-East**	**South**
Q9			
Direction	**East**	**South-East**	**South**

Q10			
Direction	**East**	**South-East**	**South**
Q11			
Direction	**East**	**South-East**	**South**

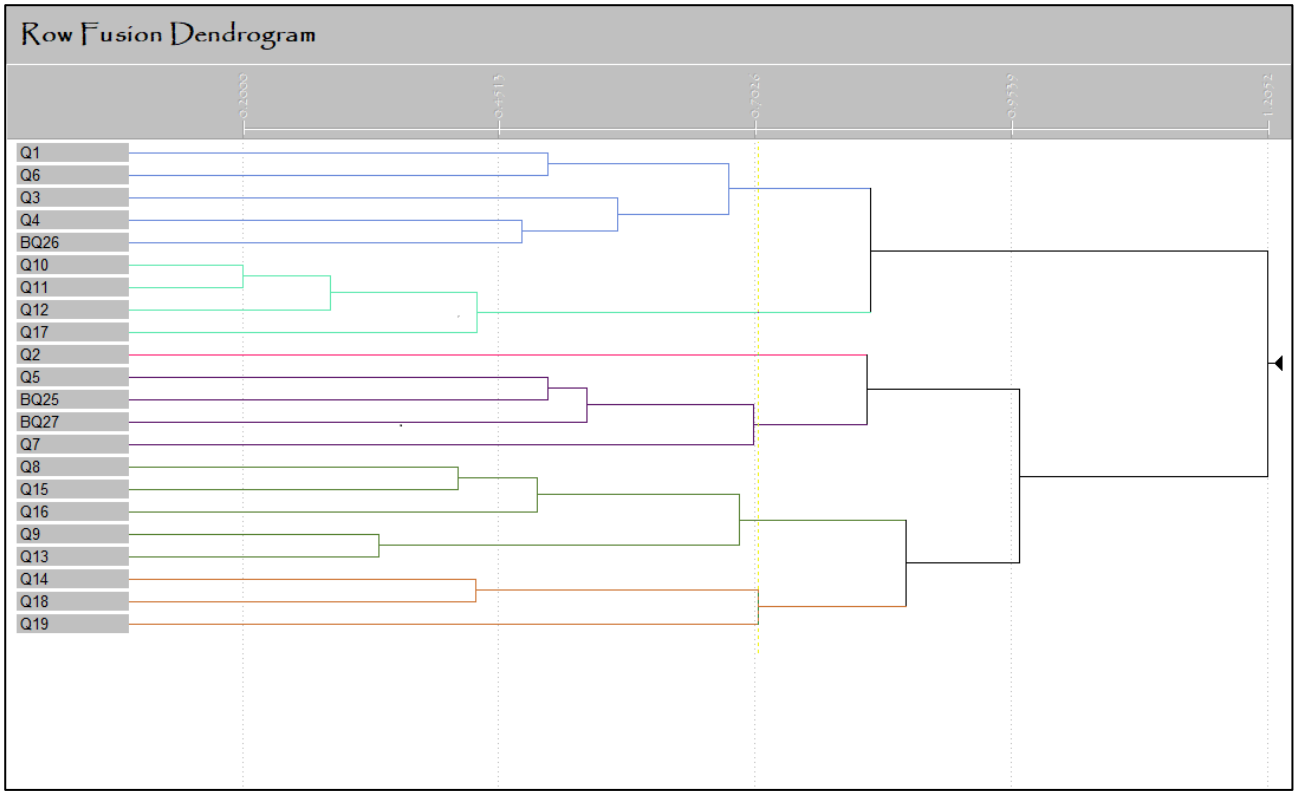
Q12			
Direction	**East**	**South-East**	**South**
Q13			
Direction	**East**	**South-East**	**South**

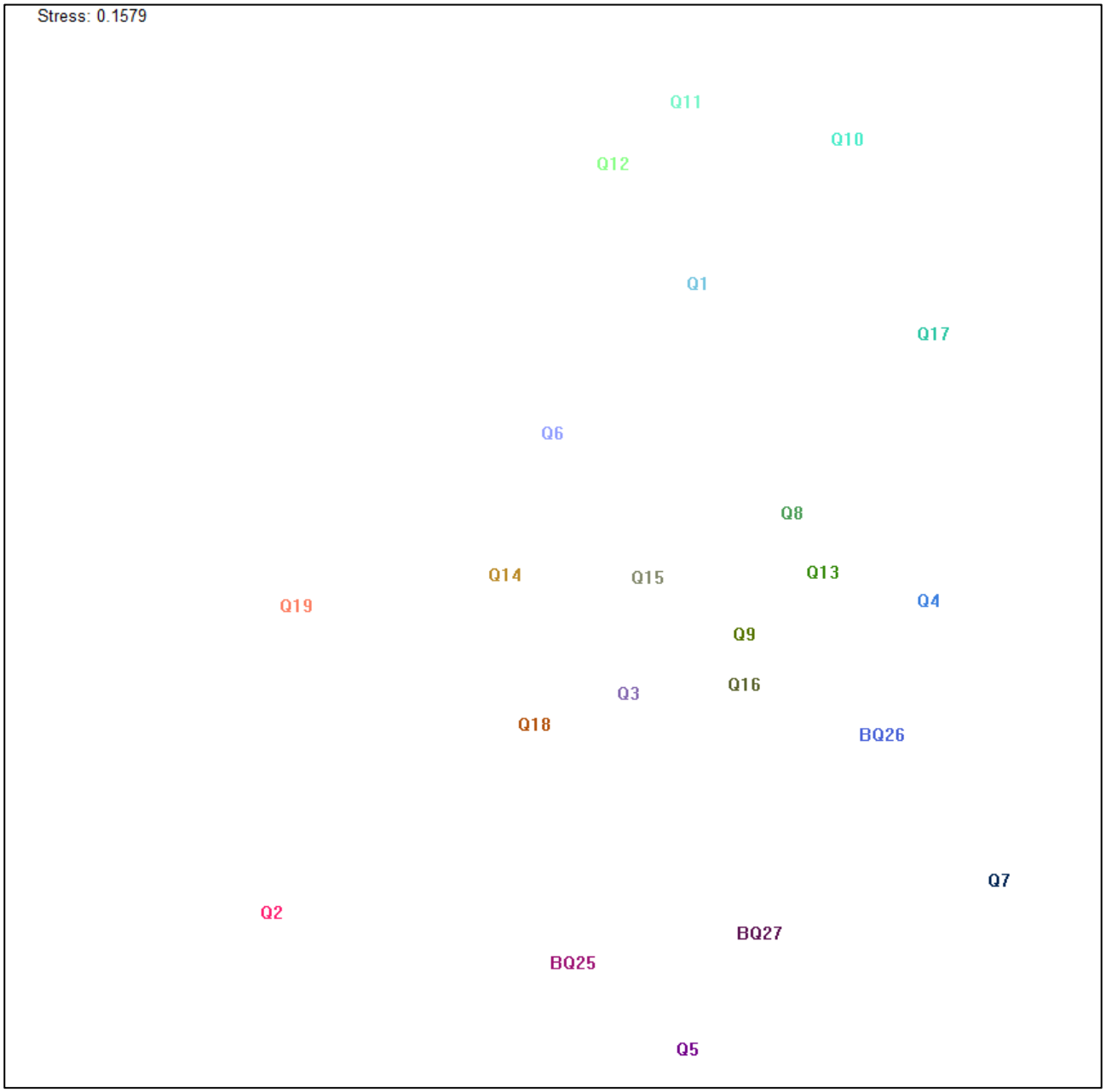
Q14			
Direction	**East**	**South-East**	**South**
Q15			
Direction	**East**	**South-East**	**South**

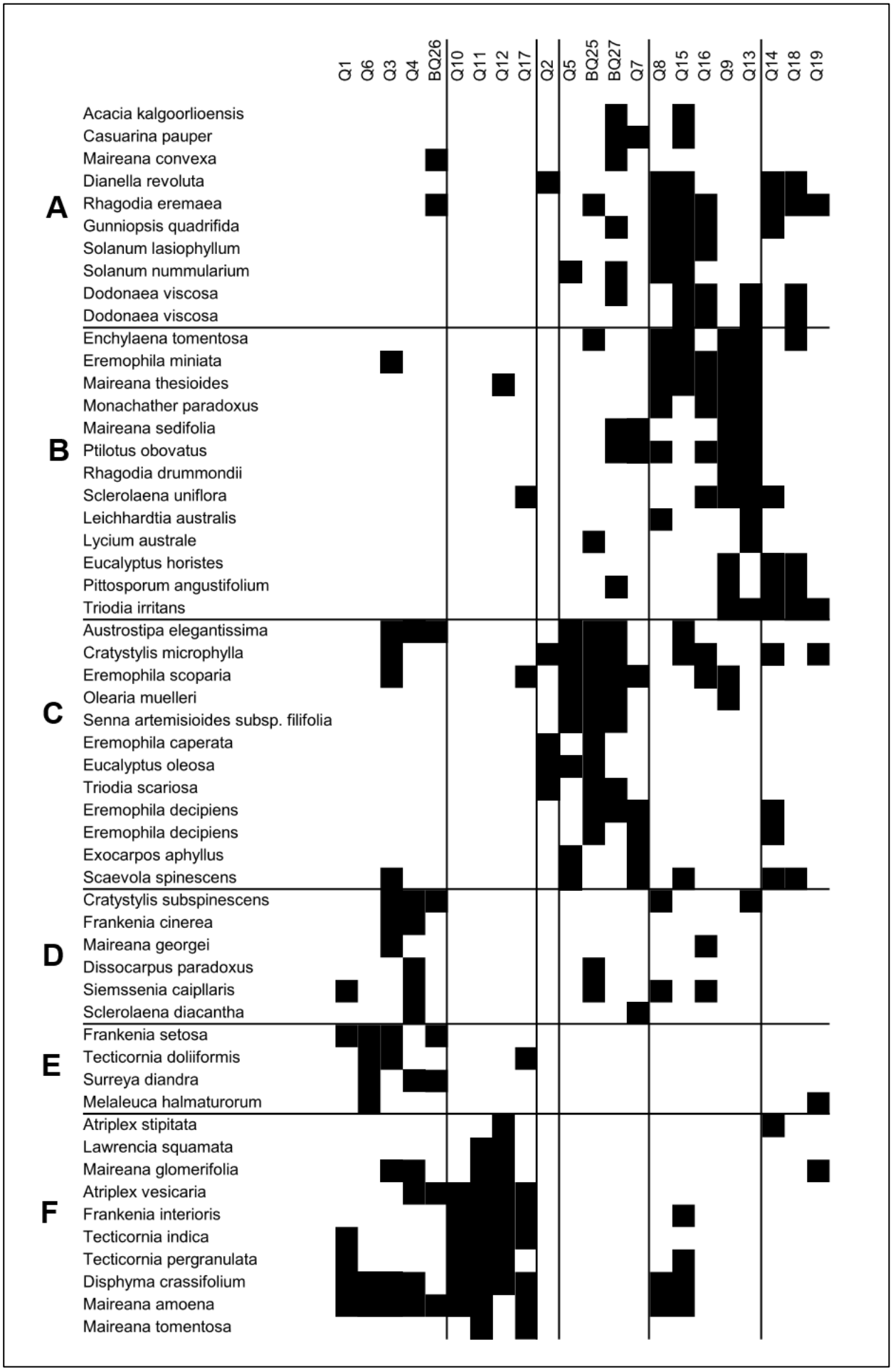
Q16			
Direction	**East**	**South-East**	**South**
Q17			
Direction	**East**	**South-East**	**South**

Q18			
Direction	**East**	**South-East**	**South**
Q19			
Direction	**East**	**South-East**	**South**

APPENDIX G:
PATN ANALYSIS RESULTS




Stress: 0.1579
Q11
Q10
Q12
Q1
Q17
Q6
Q8
Q14
Q15
Q13
Q4
Q19
Q9
Q16
Q3
Q18
BQ26
Q7
Q2
BQ27
BQ25
Q5


Q1
Q6
Q3
Q4
BQ26
Q10
Q11
Q12
Q17
Q2
Q5
BQ25
BQ27
Q7
Q8
Q15
Q16
Q9
Q13
Q14
Q18
Q19
A
Acacia kalgoorlioensis
Casuarina pauper
Maireana convexa
Dianella revoluta
Rhagodia eremaea
Gunniopsis quadrifida
Solanum lasiophyllum
Solanum nummularium
Dodonaea viscosa
Dodonaea viscosa
B
Enchylaena tomentosa
Eremophila miniata
Maireana thesioides
Monachather paradoxus
Maireana sedifolia
Ptilotus obovatus
Rhagodia drummondii
Sclerolaena uniflora
Leichhardtia australis
Lycium australe
Eucalyptus horistes
Pittosporum angustifolium
Triodia irritans
C
Austrostipa elegantissima
Cratystylis microphylla
Eremophila scoparia
Olearia muelleri
Senna artemisioides subsp. filifolia
Eremophila caperata
Eucalyptus oleosa
Triodia scariosa
Eremophila decipiens
Eremophila decipiens
Exocarpos aphyllus
Scaevola spinescens
D
Cratystylis subspinescens
Frankenia cinerea
Maireana georgei
Dissocarpus paradoxus
Siemssenia caipllaris
Sclerolaena diacantha
E
Frankenia setosa
Tecticornia doliiformis
Surreya diandra
Melaleuca halmaturorum
F
Atriplex stipitata
Lawrencia squamata
Maireana glomerifolia
Atriplex vesicaria
Frankenia interioris
Tecticornia indica
Tecticornia pergranulata
Disphyma crassifolium
Maireana amoena
Maireana tomentosa

APPENDIX H:
DANDJOO SEARCH RESULTS

GOVERNMENT OF WESTERN AUSTRALIA

Dandjoo Species List Export

Created by Guest User on 28 May 2025

Source	Dandjoo – Department of Biodiversity, Conservation and Attractions
Method	User defined circle: [[122.56837, -30.71901]] 41.0 km.
Date time	2025-05-28T11:41:27.915206+08:00

Conservation status summary	Count
None	220
P1	4
P2	1
P3	8
P4	2
Total	**235**

Kingdoms	Count
Plantae	235
Total unique species	**235**

#	Class	Family	Name	Establishment	Conservation
Plantae					
1	Liliopsida	Asparagaceae Juss.	Thysanotus R.Br.		
2	Liliopsida	Colchicaceae DC.	Wurmbea tenella (Endl.) Benth. *(Eight Nancy)*	native	
3	Liliopsida	Cyperaceae Juss.	Lepidosperma Labill.		
4	Liliopsida	Cyperaceae Juss.	Lepidosperma lyonsii R.L.Barrett	native	P1
5	Liliopsida	Juncaceae Juss.	Juncus aridicola L.A.S.Johnson	native	
6	Liliopsida	Orchidaceae Juss.	Microtis eremaea R.J.Bates	native	
7	Liliopsida	Orchidaceae Juss.	Prasophyllum gracile Lindl. *(Little Laughing Leek Orchid)*	native	
8	Liliopsida	Orchidaceae Juss.	Pterostylis R.Br. *(Greenhoods, Shell orchids, Snail orchids)*		
9	Liliopsida	Orchidaceae Juss.	Pterostylis setulosa (D.L.Jones & C.J.French) D.L.Jones & C.J.French *(Hairy-stemmed Snail Orchid)*	native	
10	Liliopsida	Orchidaceae Juss.	Pterostylis xerampelina (D.L.Jones & C.J.French) D.L.Jones & C.J.French *(Rock Loving Rufous Greenhood)*	native	P1
11	Liliopsida	Poaceae Barnhart	Amphipogon caricinus F.Muell. *(Long Greybeard Grass)*	native	
12	Liliopsida	Poaceae Barnhart	Aristida L.		
13	Liliopsida	Poaceae Barnhart	Aristida contorta F.Muell. *(Bunched Kerosene Grass)*	native	
14	Liliopsida	Poaceae Barnhart	Austrostipa turbinata A.R.Williams	native	P3
15	Liliopsida	Poaceae Barnhart	Cymbopogon ambiguus (Hack.) A.Camus *(Scentgrass)*	native	
16	Liliopsida	Poaceae Barnhart	Enneapogon avenaceus (Lindl.) C.E.Hubb.	native	
17	Liliopsida	Poaceae Barnhart	Enneapogon caerulescens (Gaudich.) N.T.Burb.	native	
18	Liliopsida	Poaceae Barnhart	Panicum decompositum R.Br.	native	
19	Liliopsida	Poaceae Barnhart	Schismus arabicus Nees *(Araby Grass)*	alien	
20	Liliopsida	Poaceae Barnhart	Triodia scariosa N.T.Burb.	native	
21	Liliopsida	Poaceae Barnhart	Tripogonella loliiformis (F.Muell.) P.M.Peterson & Romasch.	native	
22	Magnoliopsida	Amaranthaceae Juss.	Ptilotus chamaecladus Diels	native	
23	Magnoliopsida	Amaranthaceae Juss.	Ptilotus drummondii (Moq.) F.Muell. *(Narrowleaf Mulla Mulla)*	native	

24	Magnoliopsida	Amaranthaceae Juss.	Ptilotus exaltatus Nees *(Tall Mulla Mulla)*	native	
25	Magnoliopsida	Amaranthaceae Juss.	Ptilotus gaudichaudii (Steud.) J.M.Black	native	
26	Magnoliopsida	Amaranthaceae Juss.	Ptilotus obovatus (Gaudich.) F.Muell. *(Cotton Bush)*	native	
27	Magnoliopsida	Amaranthaceae Juss.	Ptilotus rigidus Lally	native	P1
28	Magnoliopsida	Apocynaceae Juss.	Alyxia buxifolia R.Br.	native	
29	Magnoliopsida	Apocynaceae Juss.	Leichhardtia australis R.Br. *(Cogola Bush)*	native	
30	Magnoliopsida	Araliaceae Juss.	Hydrocotyle L.		
31	Magnoliopsida	Araliaceae Juss.	Trachymene cyanopetala (F.Muell.) Benth.	native	
32	Magnoliopsida	Araliaceae Juss.	Trachymene ornata (Endl.) Druce *(Spongefruit)*	native	
33	Magnoliopsida	Asteraceae Bercht. & J.Presl	Asteridea athrixioides (Sond. & F.Muell.) Kroner	native	
34	Magnoliopsida	Asteraceae Bercht. & J.Presl	Centaurea melitensis L. *(Maltese Cockspur)*	alien	
35	Magnoliopsida	Asteraceae Bercht. & J.Presl	Chrysocephalum apiculatum subsp. glandulosum Paul G.Wilson	native	
36	Magnoliopsida	Asteraceae Bercht. & J.Presl	Chrysocephalum puteale (S.Moore) Paul G.Wilson	native	
37	Magnoliopsida	Asteraceae Bercht. & J.Presl	Chthonocephalus pseudevax Steetz *(Woolly Groundheads)*	native	
38	Magnoliopsida	Asteraceae Bercht. & J.Presl	Cratystylis subspinescens S.Moore *(Australian Sage)*	native	
39	Magnoliopsida	Asteraceae Bercht. & J.Presl	Erymophyllum ramosum (A.Gray) Paul G.Wilson subsp. ramosum	native	
40	Magnoliopsida	Asteraceae Bercht. & J.Presl	Hyalosperma glutinosum Steetz subsp. glutinosum	native	
41	Magnoliopsida	Asteraceae Bercht. & J.Presl	Lawrencella davenportii (F.Muell.) Paul G.Wilson	native	
42	Magnoliopsida	Asteraceae Bercht. & J.Presl	Leiocarpa semicalva (F.Muell.) Paul G.Wilson	native	
43	Magnoliopsida	Asteraceae Bercht. & J.Presl	Minuria cunninghamii (DC.) Benth.	native	
44	Magnoliopsida	Asteraceae Bercht. & J.Presl	Notisia intonsa (S.Moore) P.S.Short	native	P3
45	Magnoliopsida	Asteraceae Bercht. & J.Presl	Olearia muelleri (Sond.) Benth.	native	
46	Magnoliopsida	Asteraceae Bercht. & J.Presl	Olearia pimeleoides (DC.) Benth.	native	
47	Magnoliopsida	Asteraceae Bercht. & J.Presl	Olearia stuartii (F.Muell.) Benth.	native	
48	Magnoliopsida	Asteraceae Bercht. & J.Presl	Olearia subspicata (Hook.) Benth.	native	
49	Magnoliopsida	Asteraceae Bercht. & J.Presl	Oligocarpus calendulaceus (L.f.) Less.	alien	
50	Magnoliopsida	Asteraceae Bercht. & J.Presl	Oncosiphon suffruticosum (L.) KÃ¤llersjÃ¶	alien	
51	Magnoliopsida	Asteraceae Bercht. & J.Presl	Ozothamnus cassiope (S.Moore) Anderb.	native	
52	Magnoliopsida	Asteraceae Bercht. & J.Presl	Panaetia lessonii Cass.	native	
53	Magnoliopsida	Asteraceae Bercht. & J.Presl	Rhodanthe battii (F.Muell.) Paul G.Wilson	native	
54	Magnoliopsida	Asteraceae Bercht. & J.Presl	Rhodanthe charsleyae (F.Muell.) Paul G.Wilson	native	
55	Magnoliopsida	Asteraceae Bercht. & J.Presl	Rhodanthe chlorocephala subsp. rosea (Hook.) Paul G.Wilson	native	
56	Magnoliopsida	Asteraceae Bercht. & J.Presl	Rhodanthe floribunda (DC.) Paul G.Wilson	native	
57	Magnoliopsida	Asteraceae Bercht. & J.Presl	Rhodanthe laevis (A.Gray) Paul G.Wilson	native	

58	Magnoliopsida	Asteraceae Bercht. & J.Presl	Rhodanthe oppositifolia (S.Moore) Paul G.Wilson subsp. oppositifolia	native	
59	Magnoliopsida	Asteraceae Bercht. & J.Presl	Rhodanthe pygmaea (DC.) Paul G.Wilson	native	
60	Magnoliopsida	Asteraceae Bercht. & J.Presl	Schoenia cassiniana (Gaudich.) Steetz *(Schoenia)*	native	
61	Magnoliopsida	Asteraceae Bercht. & J.Presl	Siemssenia capillaris Steetz *(Wiry Podolepis)*	native	
62	Magnoliopsida	Asteraceae Bercht. & J.Presl	Vittadinia humerata N.T.Burb.	native	
63	Magnoliopsida	Asteraceae Bercht. & J.Presl	Waitzia acuminata Steetz var. acuminata	native	
64	Magnoliopsida	Boraginaceae Juss.	Halgania integerrima Endl.	native	
65	Magnoliopsida	Boraginaceae Juss.	Heliotropium asperrimum R.Br.	native	
66	Magnoliopsida	Boraginaceae Juss.	Heliotropium curassavicum L.	native	
67	Magnoliopsida	Boraginaceae Juss.	Heliotropium europaeum L.	alien	
68	Magnoliopsida	Boraginaceae Juss.	Plagiobothrys australasicus (A.DC.) I.M.Johnst.	native	
69	Magnoliopsida	Brassicaceae Burnett	Arabidella trisecta (F.Muell.) O.E.Schulz	native	
70	Magnoliopsida	Brassicaceae Burnett	Lepidium oxytrichum Sprague	native	
71	Magnoliopsida	Brassicaceae Burnett	Sisymbrium erysimoides Desf. *(Smooth Mustard)*	alien	
72	Magnoliopsida	Brassicaceae Burnett	Stenopetalum lineare DC. var. lineare	native	
73	Magnoliopsida	Campanulaceae Juss.	Lithotoma petraea (F.Muell.) E.B.Knox	native	
74	Magnoliopsida	Caryophyllaceae Juss.	Silene gallica L. var. gallica	alien	
75	Magnoliopsida	Casuarinaceae R.Br.	Allocasuarina campestris (Diels) L.A.S.Johnson	native	
76	Magnoliopsida	Casuarinaceae R.Br.	Allocasuarina eriochlamys (L.A.S.Johnson) L.A.S.Johnson subsp. eriochlamys	native	
77	Magnoliopsida	Casuarinaceae R.Br.	Allocasuarina eriochlamys subsp. grossa (L.A.S.Johnson) L.A.S.Johnson	native	P3
78	Magnoliopsida	Casuarinaceae R.Br.	Allocasuarina helmsii (Ewart & M.Gordon) L.A.S.Johnson	native	
79	Magnoliopsida	Casuarinaceae R.Br.	Casuarina pauper L.A.S.Johnson	native	
80	Magnoliopsida	Celastraceae R.Br.	Stackhousia muricata subsp. Perennial (W.R. Barker 3641)	native	P3
81	Magnoliopsida	Chenopodiaceae Vent.	Atriplex nummularia subsp. spathulata Aellen *(Old Man Saltbush)*	native	
82	Magnoliopsida	Chenopodiaceae Vent.	Atriplex stipitata Benth. subsp. stipitata	native	
83	Magnoliopsida	Chenopodiaceae Vent.	Chenopodium curvispicatum Paul G.Wilson	native	
84	Magnoliopsida	Chenopodiaceae Vent.	Dysphania melanocarpa (J.M.Black) Mosyakin & Clemants	native	
85	Magnoliopsida	Chenopodiaceae Vent.	Enchylaena lanata Paul G.Wilson	native	
86	Magnoliopsida	Chenopodiaceae Vent.	Eriochiton sclerolaenoides (F.Muell.) A.J.Scott	native	
87	Magnoliopsida	Chenopodiaceae Vent.	Maireana brevifolia (R.Br.) Paul G.Wilson *(Small Leaf Bluebush)*	native	
88	Magnoliopsida	Chenopodiaceae Vent.	Maireana georgei (Diels) Paul G.Wilson *(Satiny Bluebush)*	native	
89	Magnoliopsida	Chenopodiaceae Vent.	Maireana pentatropis (Tate) Paul G.Wilson	native	
90	Magnoliopsida	Chenopodiaceae Vent.	Maireana radiata (Paul G.Wilson) Paul G.Wilson	native	
91	Magnoliopsida	Chenopodiaceae Vent.	Maireana sedifolia (F.Muell.) Paul G.Wilson *(Pearl Bluebush)*	native	
92	Magnoliopsida	Chenopodiaceae Vent.	Maireana triptera (Benth.) Paul G.Wilson *(Threewinged Bluebush)*	native	
93	Magnoliopsida	Chenopodiaceae Vent.	Maireana turbinata Paul G.Wilson	native	
		Chenopodiaceae			

94	Magnoliopsida	Vent.	Sclerolaena cuneata Paul G.Wilson *(Yellow Bindii)*	native	
95	Magnoliopsida	Chenopodiaceae Vent.	Tecticornia disarticulata (Paul G.Wilson) K.A.Sheph. & Paul G.Wilson	native	
96	Magnoliopsida	Chenopodiaceae Vent.	Tecticornia pergranulata (J.M.Black) K.A.Sheph. & Paul G.Wilson subsp. pergranulata *(Blackseed Samphire)*	native	
97	Magnoliopsida	Chenopodiaceae Vent.	Tecticornia pruinosa (Paulsen) K.A.Sheph. & Paul G.Wilson	native	
98	Magnoliopsida	Chenopodiaceae Vent.	Tecticornia pterygosperma (J.M.Black) K.A.Sheph. & Paul G.Wilson subsp. pterygosperma	native	
99	Magnoliopsida	Crassulaceae J.St.-Hil.	Crassula tetramera (Toelken) A.P.Druce & Sykes	native	
100	Magnoliopsida	Fabaceae Lindl.	Acacia Mill.		
101	Magnoliopsida	Fabaceae Lindl.	Acacia aptaneura Maslin & J.E.Reid	native	
102	Magnoliopsida	Fabaceae Lindl.	Acacia burkittii Benth. *(Sandhill Wattle)*	native	
103	Magnoliopsida	Fabaceae Lindl.	Acacia collegialis Maslin *(Southern Rock Wattle)*	native	
104	Magnoliopsida	Fabaceae Lindl.	Acacia colletioides Benth. *(Wait-a-while)*	native	
105	Magnoliopsida	Fabaceae Lindl.	Acacia craspedocarpa F.Muell. *(Hop Mulga)*	native	
106	Magnoliopsida	Fabaceae Lindl.	Acacia duriuscula W.Fitzg.	native	
107	Magnoliopsida	Fabaceae Lindl.	Acacia erinacea Benth.	native	
108	Magnoliopsida	Fabaceae Lindl.	Acacia hemiteles Benth.	native	
109	Magnoliopsida	Fabaceae Lindl.	Acacia jennerae Maiden	native	
110	Magnoliopsida	Fabaceae Lindl.	Acacia kempeana F.Muell. *(Witchetty Bush)*	native	
111	Magnoliopsida	Fabaceae Lindl.	Acacia ligulata Benth. *(Umbrella Bush)*	native	
112	Magnoliopsida	Fabaceae Lindl.	Acacia merrallii F.Muell.	native	
113	Magnoliopsida	Fabaceae Lindl.	Acacia oswaldii F.Muell. *(Miljee)*	native	
114	Magnoliopsida	Fabaceae Lindl.	Acacia ramulosa W.Fitzg. *(Horse Mulga)*	native	
115	Magnoliopsida	Fabaceae Lindl.	Acacia ramulosa W.Fitzg. var. ramulosa	native	
116	Magnoliopsida	Fabaceae Lindl.	Acacia resinosa R.S.Cowan & Maslin	native	
117	Magnoliopsida	Fabaceae Lindl.	Acacia tetragonophylla F.Muell. *(Kurara)*	native	
118	Magnoliopsida	Fabaceae Lindl.	Acacia xerophila var. brevior (E.Pritz.) Maslin	native	
119	Magnoliopsida	Fabaceae Lindl.	Indigofera psammophila Peter G.Wilson	native	
120	Magnoliopsida	Fabaceae Lindl.	Medicago laciniata (L.) Mill. *(Cutleaf Medic)*	alien	
121	Magnoliopsida	Fabaceae Lindl.	Mirbelia granitica Crisp & J.M.Taylor	native	
122	Magnoliopsida	Fabaceae Lindl.	Senna artemisioides (DC.) Randell	native	
123	Magnoliopsida	Fabaceae Lindl.	Senna artemisioides subsp. filifolia Randell	native	
124	Magnoliopsida	Fabaceae Lindl.	Swainsona beasleyana F.Muell.	native	
125	Magnoliopsida	Fabaceae Lindl.	Swainsona colutoides F.Muell. *(Bladder Vetch)*	native	
126	Magnoliopsida	Geraniaceae Juss.	Erodium aureum Carolin	alien	
127	Magnoliopsida	Geraniaceae Juss.	Erodium cygnorum Nees	native	
128	Magnoliopsida	Goodeniaceae R.Br.	Coopernookia strophiolata (F.Muell.) Carolin	native	
129	Magnoliopsida	Goodeniaceae R.Br.	Dampiera latealata (E.Pritz.) Rajput & Carolin	native	
130	Magnoliopsida	Goodeniaceae R.Br.	Dampiera roycei Rajput	native	
131	Magnoliopsida	Goodeniaceae R.Br.	Dampiera tenuicaulis E.Pritz. var. tenuicaulis	native	
132	Magnoliopsida	Goodeniaceae R.Br.	Goodenia Sm.		
133	Magnoliopsida	Goodeniaceae R.Br.	Goodenia daviesii (F.Muell.) K.A.Sheph.	native	
134	Magnoliopsida	Goodeniaceae R.Br.	Goodenia elderi F.Muell. & Tate	native	
135	Magnoliopsida	Goodeniaceae R.Br.	Goodenia jaurdiensis L.W.Sage & K.A.Sheph.	native	P2
136	Magnoliopsida	Goodeniaceae R.Br.	Goodenia krauseana Carolin	native	
137	Magnoliopsida	Goodeniaceae R.Br.	Goodenia rosea (S.Moore) K.A.Sheph.	native	
138	Magnoliopsida	Goodeniaceae R.Br.	Scaevola spinescens R.Br. *(Currant Bush)*	native	
139	Magnoliopsida	Hypericaceae Juss.	Hypericum gramineum G.Forst.	native	
140	Magnoliopsida	Lamiaceae Martinov	Dicrastylis flexuosa (W.R.Price) C.A.Gardner	native	
141	Magnoliopsida	Lamiaceae Martinov	Prostanthera laricoides B.J.Conn	native	
142	Magnoliopsida	Lamiaceae Martinov	Westringia cephalantha F.Muell.	native	
143	Magnoliopsida	Lamiaceae Martinov	Westringia rigida R.Br. *(Stiff Westringia)*	native	
144	Magnoliopsida	Loranthaceae Juss.	Amyema benthamii (Blakely) Danser	native	

145	Magnoliopsida	Loranthaceae Juss.	Amyema linophylla (Fenzl) Tiegh. subsp. linophylla	native	
146	Magnoliopsida	Loranthaceae Juss.	Amyema miquelii (Miq.) Tiegh. *(Stalked Mistletoe)*	native	
147	Magnoliopsida	Loranthaceae Juss.	Amyema preissii (Miq.) Tiegh. *(Wireleaf Mistletoe)*	native	
148	Magnoliopsida	Malvaceae Juss.	Alyogyne hakeifolia (Giord.) Alef.	native	
149	Magnoliopsida	Malvaceae Juss.	Commersonia craurophylla (F.Muell.) F.Muell.	native	
150	Magnoliopsida	Malvaceae Juss.	Commersonia magniflora subsp. oblongifolia C.F.Wilkins	native	
151	Magnoliopsida	Malvaceae Juss.	Lawrencia squamata Nees	native	
152	Magnoliopsida	Malvaceae Juss.	Sida intricata F.Muell. *(Tangled Sida)*	native	
153	Magnoliopsida	Myrtaceae Juss.	Aluta aspera (E.Pritz.) Rye & Trudgen subsp. aspera	native	
154	Magnoliopsida	Myrtaceae Juss.	Enekbatus cryptandroides (F.Muell.) Trudgen & Rye	native	
155	Magnoliopsida	Myrtaceae Juss.	Eucalyptus L'Her.		
156	Magnoliopsida	Myrtaceae Juss.	Eucalyptus celastroides Turcz.	native	
157	Magnoliopsida	Myrtaceae Juss.	Eucalyptus concinna Maiden & Blakely	native	
158	Magnoliopsida	Myrtaceae Juss.	Eucalyptus cylindrocarpa Blakely	native	
159	Magnoliopsida	Myrtaceae Juss.	Eucalyptus ebbanoensis Maiden subsp. ebbanoensis	native	
160	Magnoliopsida	Myrtaceae Juss.	Eucalyptus ebbanoensis subsp. glauciramula L.A.S.Johnson & K.D.Hill	native	
161	Magnoliopsida	Myrtaceae Juss.	Eucalyptus effusa subsp. exsul L.A.S.Johnson & K.D.Hill	native	
162	Magnoliopsida	Myrtaceae Juss.	Eucalyptus flavida Brooker & Hopper	native	
163	Magnoliopsida	Myrtaceae Juss.	Eucalyptus gracilis F.Muell.	native	
164	Magnoliopsida	Myrtaceae Juss.	Eucalyptus griffithsii Maiden	native	
165	Magnoliopsida	Myrtaceae Juss.	Eucalyptus hypolaena L.A.S.Johnson & K.D.Hill	native	
166	Magnoliopsida	Myrtaceae Juss.	Eucalyptus kruseana F.Muell.	native	P4
167	Magnoliopsida	Myrtaceae Juss.	Eucalyptus lesouefii Maiden	native	
168	Magnoliopsida	Myrtaceae Juss.	Eucalyptus longissima D.Nicolle	native	
169	Magnoliopsida	Myrtaceae Juss.	Eucalyptus loxophleba subsp. lissophloia L.A.S.Johnson & K.D.Hill	native	
170	Magnoliopsida	Myrtaceae Juss.	Eucalyptus oleosa Miq. subsp. oleosa	native	
171	Magnoliopsida	Myrtaceae Juss.	Eucalyptus petraea D.J.Carr & S.G.M.Carr	native	
172	Magnoliopsida	Myrtaceae Juss.	Eucalyptus plumula D.Nicolle & M.E.French	native	
173	Magnoliopsida	Myrtaceae Juss.	Eucalyptus ravida L.A.S.Johnson & K.D.Hill	native	
174	Magnoliopsida	Myrtaceae Juss.	Eucalyptus rigidula Maiden	native	
175	Magnoliopsida	Myrtaceae Juss.	Eucalyptus rigidula subsp. interior D.Nicolle & M.E.French	native	
176	Magnoliopsida	Myrtaceae Juss.	Eucalyptus salmonophloia F.Muell.	native	
177	Magnoliopsida	Myrtaceae Juss.	Eucalyptus salubris F.Muell.	native	
178	Magnoliopsida	Myrtaceae Juss.	Eucalyptus transcontinentalis Maiden	native	
179	Magnoliopsida	Myrtaceae Juss.	Eucalyptus websteriana Maiden	native	
180	Magnoliopsida	Myrtaceae Juss.	Eucalyptus woodwardii Maiden	native	
181	Magnoliopsida	Myrtaceae Juss.	Eucalyptus x brachyphylla C.A.Gardner	native	P4
182	Magnoliopsida	Myrtaceae Juss.	Eucalyptus yilgarnensis (Maiden) Brooker	native	
183	Magnoliopsida	Myrtaceae Juss.	Homalocalyx thryptomenoides (F.Muell.) Craven	native	
184	Magnoliopsida	Myrtaceae Juss.	Melaleuca coccinea A.S.George *(Goldfields Bottlebrush)*	native	P3
185	Magnoliopsida	Myrtaceae Juss.	Melaleuca eleuterostachya F.Muell.	native	
186	Magnoliopsida	Myrtaceae Juss.	Melaleuca fulgens R.Br. subsp. fulgens	native	
187	Magnoliopsida	Myrtaceae Juss.	Melaleuca halmaturorum Miq.	native	
188	Magnoliopsida	Myrtaceae Juss.	Melaleuca hamata Fielding & Gardner	native	
189	Magnoliopsida	Myrtaceae Juss.	Melaleuca macronychia subsp. trygonoides K.J.Cowley	native	P3
190	Magnoliopsida	Myrtaceae Juss.	Melaleuca sheathiana W.Fitzg. *(Boree)*	native	
191	Magnoliopsida	Myrtaceae Juss.	Micromyrtus serrulata J.W.Green	native	P3
192	Magnoliopsida	Myrtaceae Juss.	Thryptomene urceolaris F.Muell.	native	
193	Magnoliopsida	Phyllanthaceae Martinov	Dendrophyllanthus erwinii (J.T.Hunter & J.J.Bruhl) R.W.Bouman	native	
194	Magnoliopsida	Pittosporaceae R.Br.	Pittosporum angustifolium Lodd., G.Lodd. & W.Lodd.	mixed	
195	Magnoliopsida	Primulaceae Borkh.	Lysimachia arvensis (L.) U.Manns & Anderb. *(Pimpernel)*	alien	
196	Magnoliopsida	Proteaceae Juss.	Grevillea acuaria Benth.	native	
197	Magnoliopsida	Proteaceae Juss.	Grevillea juncifolia subsp. temulenta Olde & Marriott	native	
198	Magnoliopsida	Proteaceae Juss.	Grevillea phillipsiana McGill.	native	P1

199	Magnoliopsida	Proteaceae Juss.	Hakea francisiana F.Muell. *(Emu Tree)*	native	
200	Magnoliopsida	Proteaceae Juss.	Hakea minyma Maconochie	native	
201	Magnoliopsida	Proteaceae Juss.	Hakea preissii Meisn. *(Needle Tree)*	native	
202	Magnoliopsida	Proteaceae Juss.	Hakea recurva Meisn. subsp. recurva	mixed	
203	Magnoliopsida	Rhamnaceae Juss.	Cryptandra aridicola Rye	native	
204	Magnoliopsida	Rutaceae Juss.	Cyanothamnus coerulescens subsp. spinescens (Benth.) Duretto & Heslewood	native	
205	Magnoliopsida	Rutaceae Juss.	Phebalium Vent.		
206	Magnoliopsida	Santalaceae R.Br.	Leptomeria preissiana (Miq.) A.DC.	native	
207	Magnoliopsida	Sapindaceae Juss.	Dodonaea lobulata F.Muell. *(Bead Hopbush)*	native	
208	Magnoliopsida	Sapindaceae Juss.	Dodonaea viscosa subsp. angustissima (DC.) J.G.West	native	
209	Magnoliopsida	Scrophulariaceae Juss.	Eremophila R.Br.		
210	Magnoliopsida	Scrophulariaceae Juss.	Eremophila arachnoides subsp. tenera Chinnock *(Slender-leaved Eremophila)*	native	P3
211	Magnoliopsida	Scrophulariaceae Juss.	Eremophila caperata Chinnock	native	
212	Magnoliopsida	Scrophulariaceae Juss.	Eremophila decipiens Ostenf. subsp. decipiens *(Slender Fuschia Bush)*	native	
213	Magnoliopsida	Scrophulariaceae Juss.	Eremophila forrestii F.Muell. subsp. forrestii	native	
214	Magnoliopsida	Scrophulariaceae Juss.	Eremophila granitica S.Moore *(Granite Poverty Bush)*	native	
215	Magnoliopsida	Scrophulariaceae Juss.	Eremophila ionantha Diels *(Violet-flowered Eremophila)*	native	
216	Magnoliopsida	Scrophulariaceae Juss.	Eremophila maculata subsp. brevifolia (Benth.) Chinnock *(Native Fuchsia)*	native	
217	Magnoliopsida	Scrophulariaceae Juss.	Eremophila oldfieldii subsp. angustifolia (S.Moore) Chinnock	native	
218	Magnoliopsida	Scrophulariaceae Juss.	Eremophila oppositifolia subsp. angustifolia (S.Moore) Chinnock *(Western Weeooka)*	native	
219	Magnoliopsida	Scrophulariaceae Juss.	Eremophila parvifolia subsp. auricampi Chinnock	native	
220	Magnoliopsida	Scrophulariaceae Juss.	Eremophila platythamnos Diels subsp. platythamnos	native	
221	Magnoliopsida	Scrophulariaceae Juss.	Eremophila pustulata S.Moore	native	
222	Magnoliopsida	Scrophulariaceae Juss.	Eremophila sp. Plumridge Lakes (S.G.M. Carr 534)	native	
223	Magnoliopsida	Solanaceae Juss.	Solanum lasiophyllum Poir. *(Flannel Bush)*	mixed	
224	Magnoliopsida	Solanaceae Juss.	Solanum orbiculatum Poir. subsp. orbiculatum *(Round-leaved Solanum)*	native	
225	Magnoliopsida	Solanaceae Juss.	Solanum petrophilum F.Muell. *(Rock Nightshade)*	native	
226	Magnoliopsida	Solanaceae Juss.	Solanum terraneum Symon	native	
227	Magnoliopsida	Thymelaeaceae Juss.	Pimelea microcephala R.Br. *(Shrubby Riceflower)*	native	
228	Magnoliopsida	Thymelaeaceae Juss.	Pimelea microcephala R.Br. subsp. microcephala	native	
229	Magnoliopsida	Thymelaeaceae Juss.	Pimelea spiculigera var. thesioides (S.Moore) Rye	native	
230	Magnoliopsida	Urticaceae Juss.	Parietaria cardiostegia Greuter	native	
231	Magnoliopsida	Zygophyllaceae R.Br.	Roepera eremaea (Diels) Beier & Thulin	native	
232	Magnoliopsida	Zygophyllaceae R.Br.	Roepera reticulata (R.M.Barker) Beier & Thulin	native	
233	Pinopsida	Cupressaceae Gray	Callitris columellaris F.Muell.	mixed	
234	Psilotopsida	Ophioglossaceae Martinov	Ophioglossum lusitanicum L.	native	
235	Pteridopsida	Pteridaceae E.D.M.Kirchn.	Cheilanthes sieberi Kunze subsp. sieberi	native	

Conservation status definitions

Threatened species

- CR – Critically Endangered
- EN – Endangered
- VU – Vulnerable
- EX – Extinct
- EW – Extinct in the Wild
- CD – Species of special conservation interest (conservation dependent)
- OS – Species otherwise in need of special protection (other specially protected)
- MI – Migratory
- SP – Specially protected species

Priority species

- P1 – Priority 1: Poorly-known species – known from few locations, none on conservation lands
- P2 – Priority 2: Poorly-known species – known from few locations, some on conservation lands
- P3 – Priority 3: Poorly-known species – known from several locations
- P4 – Priority 4: Rare, Near Threatened and other species in need of monitoring

Dandjoo specific codes

- Parent of conservation listed taxa
- Cons code inherited from parent, X

Read full definitions at https://bio.wa.gov.au/guide/conservation-status-definitions

Disclaimer

Further note, precise locations of conservation listed species are considered sensitive. To protect this information, obfuscation has been applied to conservation-listed species records. For these species, the true location is ±10km from the search area used to generate this species list.

APPENDIX I:
EPBC PMST SEARCH RESULTS

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: 28-May-2025

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:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	11
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	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
BIRD		
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Polytelis alexandrae Princess Parrot, Alexandra's Parrot [758]	Vulnerable	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area
MAMMAL		

Scientific Name	Threatened Category	Presence Text
Dasyurus geoffroii		
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area
Sminthopsis psammophila		
Sandhill Dunnart [291]	Endangered	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

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

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area
Thinornis cucullatus as Thinornis rubricollis		
Hooded Plover, Hooded Dotterel [87735]		Species or species habitat likely to occur within area overfly marine area
Tringa nebularia		
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area overfly marine area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State
Cardunia Rocks	Nature Reserve	WA
Coonana Timber Reserve	5(1)(g) Reserve	WA
Wallaby Rocks Timber Reserve	5(1)(g) Reserve	WA

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Nava-1 Cable System	2001/510	Controlled Action	Completed
Not controlled action			
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed

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 is 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 on the contents of this report.

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 point locations and environmental data layers.

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 when time permits.

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 breeding sites; and
- 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

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-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
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-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

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

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