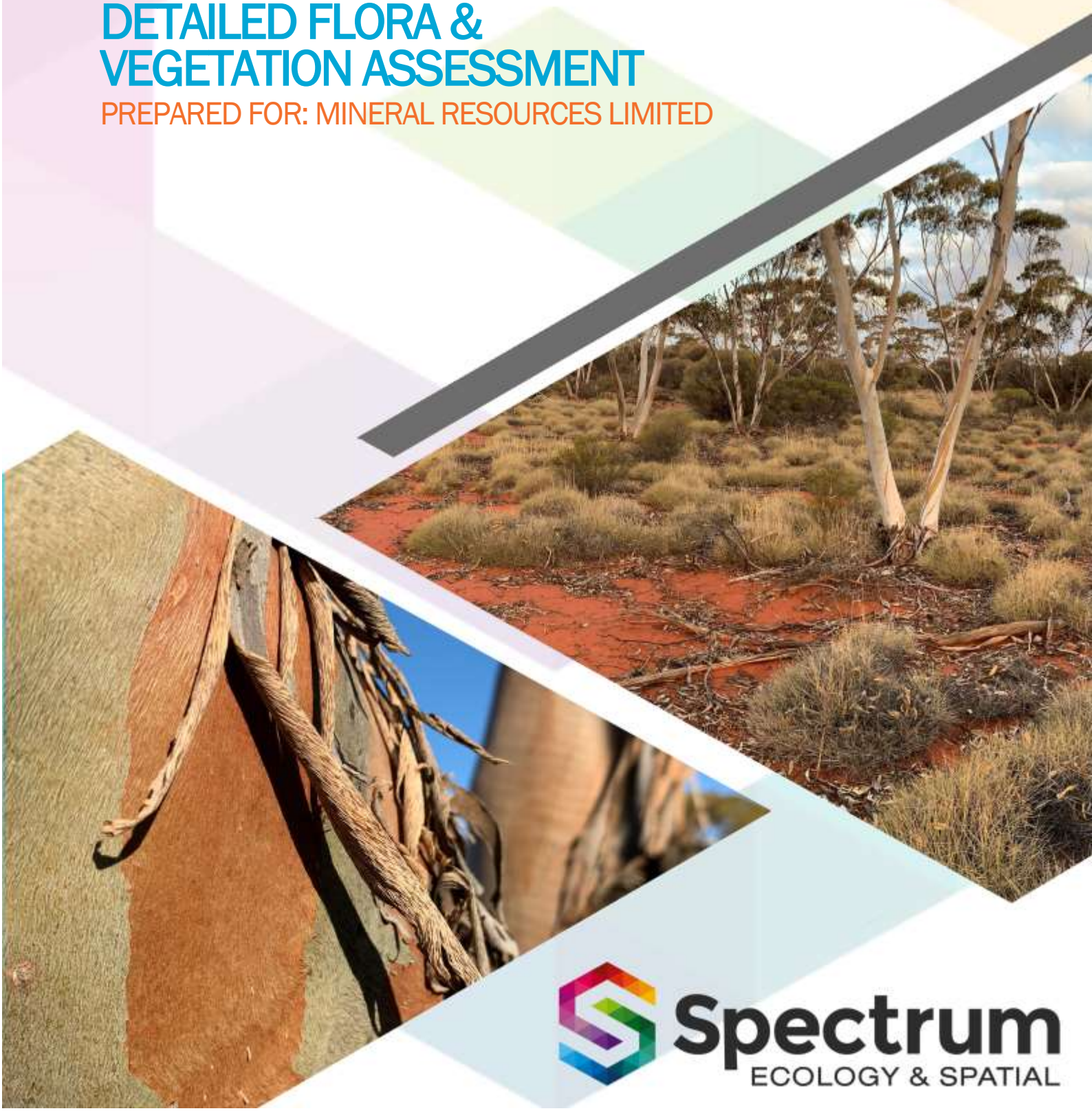
# MT MARION – MINRES & M15/717 TENEMENTS

## DETAILED FLORA & VEGETATION ASSESSMENT

PREPARED FOR: MINERAL RESOURCES LIMITED



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# EXECUTIVE SUMMARY

Mineral Resources Limited engaged Spectrum Ecology & Spatial to undertake a two-phased detailed flora and vegetation assessment covering the Hamptons Tenement in the Mt. Marion Lithium Project area (the Survey Area). The Survey Area is located approximately 60 km southwest of Kalgoorlie in the Goldfields region of Western Australia and covers 22,582.2 ha.

Phase 1 was undertaken from the 26 September to the 2 October 2023 (spring), and phase 2 was undertaken from the 3 April to the 15 April 2024 (autumn) for a total of 64 field person days. The field survey timing was conducted in accordance with EPA recommendations for the Interzone Botanical province of which the Coolgardie IBRA region is located. A total of 57 quadrats (31 phase 1, 26 phase 2), 12 relevés (6 phase 1, 6 phase 2), and 202.8 km of targeted traverses were sampled during the assessment.

A total of 239 taxa from 38 families and 114 genera were recorded within the Survey Area. Of the 239 taxa recorded, nine were introduced flora species. One of the introduced flora species recorded, **Tamarix aphylla* is classified as a Declared Pest under the *Biosecurity and Agriculture Management Act 2007* but has no category management requirement within Western Australia. The remaining introduced flora are classified as permitted s11 weeds. None of the introduced flora were a dominant species in any of the VTs.

No Threatened flora were recorded or considered likely to occur within the Survey Area. Seven Priority Flora taxa, and three range extensions were recorded:

- Priority 1 (P1): *Acacia websteri*, *Ptilotus procumbens*, *Thryptomene planiflora*;
- Priority 2 (P2): *Phebalium clavatum;*
- Priority 3 (P3): *Cyathostemon verrucosus*, *Eremophila acutifolia*, *Eucalyptus urna* subsp. *xesta*.
- Range Extensions: *Paspalidium basicladum*, *Santalum murrayanum*, and **Tamarix aphylla*.

Of the seven Priority Flora taxa recorded, one, *Ptilotus procumbens* (P1), was assigned a high local and regional significance and one, *Phebalium clavatum* (P2), was assigned a high regional significance.

All of the Threatened and Priority Flora identified as having a 'High' likelihood of occurrence in the desktop assessment, that were not recorded in the Survey Area, have been reduced to a 'Medium' or 'Low' likelihood of occurrence post-survey, as suitable habitat was identified for these Priority taxa and survey timing was adequate for annual species to occur.

Vegetation mapping was undertaken for a larger project area that encompassed the Survey Area within. A total of 143 quadrats were used in the analysis which included 69 phase 1 quadrats and 74 phase 2 quadrats. Of these, 26 phase 1 and 25 phase 2 quadrats were within the MinRes-M15/717 Survey Area.

A total of 25 vegetation types (VTs), were described from the combined Survey Areas, including 17 from floristic analysis of quadrat data, and eight additional structural groups. A total of 16 of the VTs were mapped at the Survey Area. The majority of the Survey Area was mapped as mixed *Eucalyptus* spp. mid open woodlands on clay or sandy plains, floodplains, and minor drainage areas (VT05, VT10, VT11, VT16, VT17, VT18, VT19, VT20, and VT21). This was followed by mixed *Eucalyptus* spp. low woodlands over mixed *Acacia* spp. and *Allocasuarina* spp. tall shrublands on gentle to moderately sloping basalt hills (VT13, VT14, and VT23), *Acacia* spp. and *Melaleuca* spp. tall shrublands on and in the vicinity of outcropping granite (VT24), and *Acacia* and *Allocasuarina* tall shrublands on sandy, lateritic yellow hill slopes (VT01, VT02). VT21 was the most widespread VT in the Survey Area, making up 36.9% of its total extent. None of the vegetation types recorded resembled any known Threatened or Priority Ecological Communities.

Four of the five significant vegetation from the literature review assigned 'Medium' likelihood of occurrence during the desktop assessment, were given a 'High' likelihood of occurrence post-survey, as the survey effort recorded similar VTs to those identified in the desktop assessment that supported Priority listed flora.

Based on the definitions of significant vegetation listed in section 2.4.4 (Environmental Protection Authority, 2016a) Six vegetation types were considered significant:

- VT01 provides a role of refuge for the regionally significant Priority flora taxon *Phebalium clavatum* (P2). VT01 also provides a role of refuge for another two Priority flora taxa, *Cyathostemon verrucosus* (P3), and *Thryptomene planiflora* (P1).
- VT02 provides a role of refuge for the regionally significant Priority flora taxon *Phebalium clavatum* (P2). VT02 also provides a role of refuge for another two Priority flora taxa, *Acacia websteri* (P1), and *Thryptomene planiflora* (P1).
- VT13 provides a role as refuge for the locally and regionally significant *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2) as well as another priority species, *Eremophila acutifolia* (P3).
- VT20 provides a role of refuge for the locally and regionally significant Priority flora taxon *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2).
- VT23 provides refuge to the locally significant Priority flora taxon, *Eucalyptus websteriana* subsp. *norsemanica* (P1) and the locally and regionally significant taxon, *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2).
- VT24 provides refuge to the locally significant Priority flora taxon, *Lepidium genistoides* (P3) and the locally and regionally significant taxon, *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2).

Vegetation condition of the Survey Area ranged from 'Pristine' to 'Very Good' with the majority in 'Pristine' (41.7%) condition. The remaining area was in 'Excellent' (26.5%) or 'Very Good' (20.2%) condition where low to moderate weed abundance or low to high grazing or dust was present. The remaining 11.6% was mapped as 'Completely Degraded' in the areas that have been cleared for roads and infrastructure with no vegetation present.

No significant limitations and constraints impacted the collection of data or the outcome of the detailed flora and vegetation assessment.

# 1. INTRODUCTION

## 1.1. Project Background

Process Minerals International Pty Ltd (PMI) operates the Mt Marion Lithium Project (the Project) in the Goldfields region of Western Australia (WA; Map 1.1). PMI is a 100% subsidiary of Mineral Resources Limited (MinRes), who holds an exclusive Life of Mine (LOM) Mining Services Agreement (MSA) with Reed Industrial Minerals Pty Ltd (RIM), the holder of most of the Mt Marion tenements. Pursuant to this MSA, MinRes designed and built, and now operates, the Project through a joint venture agreement with PMI and Gangfeng Lithium Co. Ltd (Mineral Resources Limited).

In 2023 Spectrum Ecology & Spatial (Spectrum) was commissioned to undertake a detailed flora and vegetation survey of MinRes and M15/717 Tenement operations, located approximately 60 km southwest of Kalgoorlie and covering 8478.6 ha (Survey Area; Map 1.1). Additionally, a desktop assessment of the wider Study Area (50 km buffer of the Survey Area) was to be completed prior to commencing the survey to identify potential significant flora and vegetation.

## 1.2. Project Scope & Objectives

The scope included a desktop assessment and two-phased detailed flora and vegetation survey to describe the flora and vegetation values across the Survey Area. The following tasks were undertaken:

- Complete a desktop assessment, including database searches, literature review and a likelihood of occurrence assessment for significant flora and vegetation at the Survey Area.
- Conduct a two-phase detailed flora and vegetation field survey of the Survey Area to develop a flora species list, describe and map the vegetation types and condition, and undertake targeted searches for conservation significant species.
- Prepare a detailed flora and vegetation report including defining significant flora and vegetation recorded to inform future environmental approvals.

This report documents the results from the two-phase flora and vegetation assessment undertaken in spring 2023 (primary season) and autumn 2024 (supplementary season).

## 1.3. Legislation & Guidelines

Flora in Western Australia are protected by various legislation, including:

- *Biodiversity Conservation Act 2016* (BC Act);
- *Environmental Protection Act 1986* (EP Act); and
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The survey was compliant with survey guidelines, as outlined in:

- EPA Environmental Factor Guideline: Flora and Vegetation (Environmental Protection Authority, 2016a);
- EPA Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment (Environmental Protection Authority, 2016b);
- DBCA Threatened and Priority Flora Report Form – Field Manual(Department of Biodiversity Conservation and Attractions, 2023); and
- National Vegetation Information System (NVIS) Australian Vegetation Attribute Manual (ESCAVI, 2003).


## Legend

- Kalgoorlie
- M15/717 Survey Area
- MinRes Survey Area
- Study Area (50km)
- Priority Ecological Community
- Environmentally Sensitive Area
- Significant Wetlands

**Conservation Estates**

- Burra
- Dordie Rocks
- Goldfields Woodlands
- Kalgoorlie Arboretum
- Kambalda
- Kangaroo Hills Timber Reserve
- Kurrawang
- Lakeside Timber Reserve
- Ngadju
- Scahill Timber Reserve
- Victoria Rock
- Yallari Timber Reserve


N

0 10 20 30 km

Scale 1:1,000,000 @ A4

Coordinate System: GDA 2020 MGA Zone 51
Projection: Universal Transverse Mercator
Units: Metre

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Author: ZG

Date: 12-09-2024

# Location of the Survey Area & Significant Lands

Mt Marion - MinRes & M15/717 Tenements - Detailed Flora & Vegetaion Assessment

MAP 1.1

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## 1.4. Bioregion

The Interim Biogeographic Regionalisation for Australia (IBRA) classifies Australia into 89 biogeographic regions and 419 subregions based on the dominant landscape, climate, lithology, geology, landform, and vegetation (Thackway and Cresswell, 1995).

The Survey Area occurs within the Eastern Goldfield subregion (100%) of the Coolgardie bioregion (Figure 1.1), which is characterised by granite rocky outcrops, low greenstone hills, laterite uplands and broad plains. Numerous salt lakes also occur through the bioregion. The Coolgardie bioregion covers the interzone between mulga and spinifex country, and eucalypt environments. The major population centres are Kalgoorlie, Coolgardie, and Norseman (McKenzie, May, and McKenna, 2003).


Figure 1.1: IBRA Classification

## 1.5. Disturbance History

The Eastern Goldfields subregion is mainly used for Unallocated Crown Land (UCL) and Crown reserves (66.7%) with lesser areas of grazing native pasture (17%), cultivation (2.3%) and UCL and Conservation reserves (11.5%; Cowan, 2001).

## 1.6. Geology

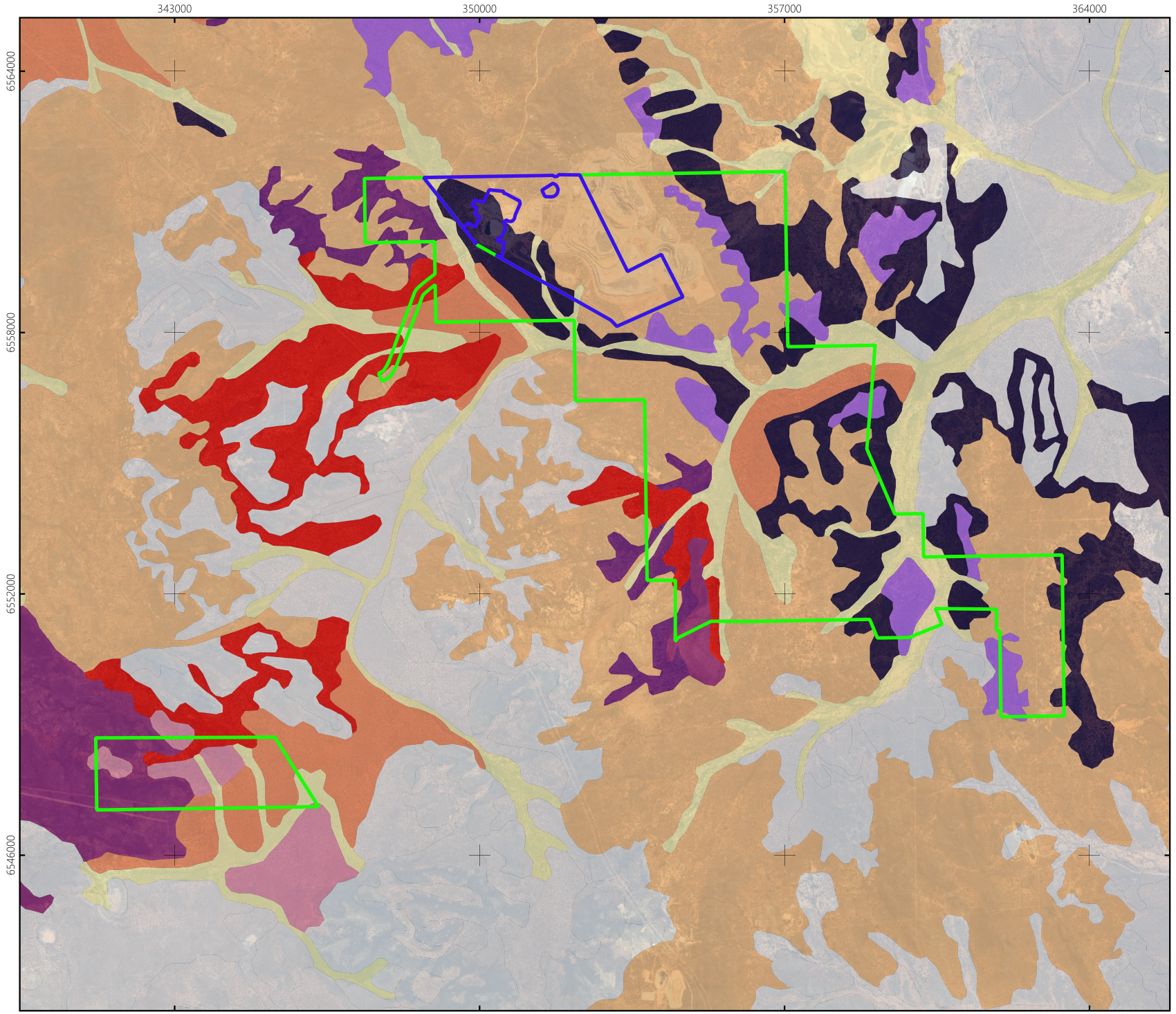
The geology of Western Australia has been mapped at a scale of 1:50,000, 1:100,000,1:250,000, and 1:500,000. The Survey Area occurs in the central west of the 1:500,000 scale geological mapping (Department of Mines, 2019), which is the finest-scale digital mapping available for the area mapped to the state extent.

Nine units were mapped within the Survey Area (Table 1.1; Map 1.2); with the exposed bedrock unit X-YPP comprising the largest extent (41.8%), followed by the colluvial unit C-YPP (17.6%), and the alluvial/fluvial unit A-YPP (12.8%). None of the geological units appear to be restricted in WA.

Table 1.1: Surface Geology

| Unit Code | Landform^ | Description | Area in Survey Area (ha) | % of Survey Area | Total WA Extent (ha) | Total Coolgardie Extent (ha) | % of Coolgardie Extent Within Survey Area |
|---|---|---|---|---|---|---|---|
| A-YPP | Alluvial/fluvial unit | Clay, silt, sand, and gravel in channels and on floodplains | 1082.6 | 12.8 | 2,661,676 | 657,909.7 | 0.2 |
| C-YPP | Colluvial unit | Colluvium derived from different rock types; includes gravel, sand, and silt | 1496.0 | 17.6 | 4,850,882 | 1,072,215 | 0.1 |
| Rr-f-YPP | Residual or relict unit | Ferruginous duricrust, massive to rubbly; includes iron-cemented reworked products | 598.0 | 7.1 | 4,351,864 | 521,307 | 0.1 |
| Rs-g-YPP | Residual or relict unit | Quartzofeldspathic sand, commonly over granite | 259.9 | 3.1 | 860,799 | 104,253 | 0.3 |
| Rs-l-YPP | Residual or relict unit | Yellow sand with minor pisolitic laterite, ferruginized silcrete, silt, and clay; common on low plateaus associated with weathered granite | 327.0 | 3.9 | 8,153,527 | 2,861,687 | <0.1 |
| S-YPP | Sandplain unit | Residual and eolian sand with minor silt and clay; low vegetated dunes locally common. | 174.2 | 2.1 | 8,969,332 | 321,600 | <0.1 |
| W-g-YPP | Sheetwash unit | Clay, silt, and sand sheetwash deposits, commonly derived from granitic rock | 328.1 | 3.9 | 466,748 | 86,168 | 0.4 |
| W -YPP | Sheetwash unit | Clay, silt, and sand in extensive fans; local ferruginous gravel | 665.0 | 7.8 | 10,663,356 | 1,461,886 | <0.1 |
| X-YPP | Exposed unit | Exposed bedrock | 3547.8 | 41.8 | 9,435,694 | 929,583 | 0.4 |

^All landforms are considered to be Youngest Post-Palaeozoic (YPP). It is a term used to describe geological units or formations that are the most recent in the geologic time scale, specifically referring to rocks and sediments that have formed since the end of the Palaeozoic era.




## Legend

- MinRes Survey Area
- M15/717 Survey Area

**Unit Code**

- A-YPP
- C-YPP
- Rr-f-YPP
- Rs-g-YPP
- Rs-l-YPP
- S-YPP
- W-g-YPP
- W-YPP
- X-YPP
- Units not in SA

N

0 1 2 3 4 km

Scale 1:120,000 @ A4

Coordinate System: GDA 2020 MGA Zone 51
Projection: Universal Transverse Mercator
Units: Metre

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Author: ZG

Date: 27-09-2024

# Surface Geology

Mt Marion - MinRes & M15/717 Tenements - Detailed Flora & Vegetation Assessment

MAP 1.2

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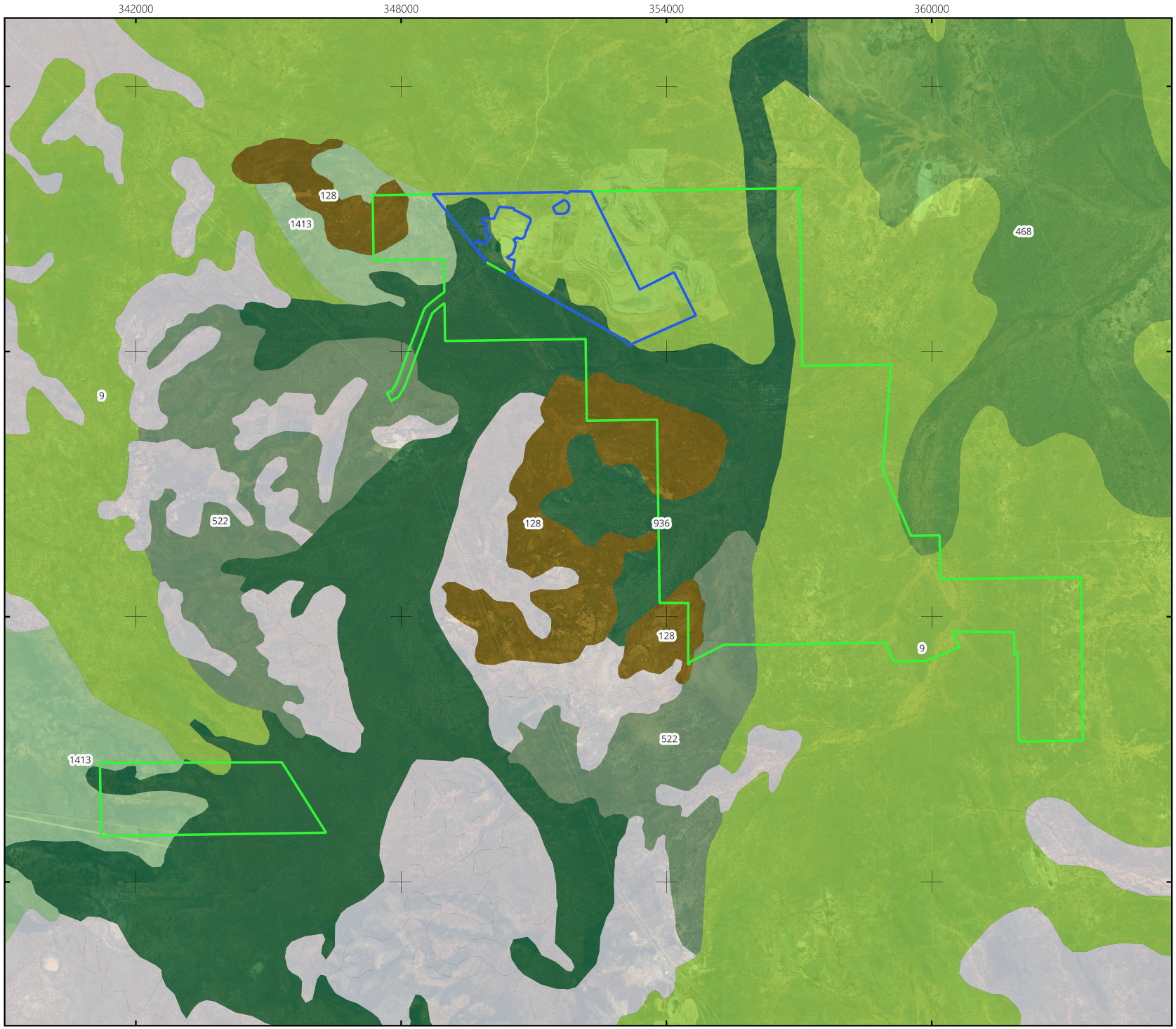
## 1.7. Beard Vegetation Association Mapping

Pre-European vegetation mapping was originally undertaken by Beard at various scales across the state and has since been updated to be consistent with the National Vegetation Information System (NVIS) descriptions at a scale of 1:250,000 (Department of Primary Industries and Regional Development, 2019b). State-wide vegetation statistics are available from 2018 for these associations which lists pre-European extent, current extent, area in DBCA managed lands and is a useful tool to determine if a vegetation association is rare or otherwise significant (Department of Biodiversity Conservation and Attractions, 2019a).

Six Beard Vegetation Associations (BVAs) have been mapped within the Survey Area (Table 1.2; Map 1.3). The most common was BVA9, which was mapped as 55.5% of the Survey Area, followed by BVA936, which was mapped as 28.9% of the Survey Area. BVA128 covered another 6.7% and the three remaining BVAs 1413 (5.0%), 522 (3.6%), and 468 (0.4%) covered the remaining 9% of the Survey Area. All BVAs except for BVA128, and 1413 appear restricted to the Coolgardie region in Western Australia, however they are all well represented in the area, and have over 88.0% of the pre-European vegetation extent remaining.

Table 1.2: Beard Vegetation Associations

| BVA | NVIS Level V Description | Area in Survey Area (ha) | % of Survey Area | Pre-European Extent WA (ha) | Current Extent WA (ha) | Current Coolgardie Extent WA (ha) | % Remaining | % of Current WA Extent in Survey Area | % Current Coolgardie Extent in Survey Area |
|---|---|---|---|---|---|---|---|---|---|
| 9 | *Eucalyptus torquata*, *Eucalyptus lesouefii*, and *Eucalyptus clelandii* low woodland, over *Eremophila scoparia*, *Eremophila glabra*, and *Eremophila oldfieldii* tall sparse shrubland. | 4702.6 | 55.5 | 240,509 | 235,162 | 235,101 | 97.8 | 2.0 | 2.0 |
| 128 | Bare areas; rock outcrops. | 569.4 | 6.7 | 327,983 | 288,766 | 183,891 | 88.0 | 0.2 | 0.3 |
| 468 | *Eucalyptus salmonophloia* and *Eucalyptus dundasii* mid woodland. | 31.2 | 0.4 | 66,475 | 62,253 | 61,727 | 93.6 | <0.1 | <0.1 |
| 522 | *Eucalyptus transcontinentalis* and *Eucalyptus flocktoniae* mid woodland. | 308.4 | 3.6 | 356,094 | 355,624 | 334,496 | 99.9 | <0.1 | <0.1 |
| 936 | *Eucalyptus salmonophloia*, *Eucalyptus lesouefii*, and *Eucalyptus transcontinentalis* mid woodland, over *Atriplex* spp. open chenopod shrubland | 2448.1 | 28.9 | 57,830 | 57,459 | 57,459 | 99.4 | 4.3 | 4.3 |
| 1413 | *Acacia* spp., *Allocasuarina campestris*, and *Melaleuca uncinata* tall shrubland. | 419.0 | 5.0 | 1,679,916 | 1,286,855 | 1,042,554 | 98.2 | <0.1 | <0.1 |




## Legend

- MinRes Survey Area
- M15/717 Survey Area

**BVA**

- 9
- 128
- 468
- 522
- 936
- 1413
- BVA Not in SA

N

0 1 2 3 4 km

Scale 1:120,000 @ A4

Coordinate System: GDA 2020 MGA Zone 51
Projection: Universal Transverse Mercator
Units: Metre

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Author: ZG

Date: 12-09-2024

# Beard Vegetation Association

Mt Marion - MinRes & M15/717 Tenements - Detailed Flora & Vegetation Assessment

MAP 1.3

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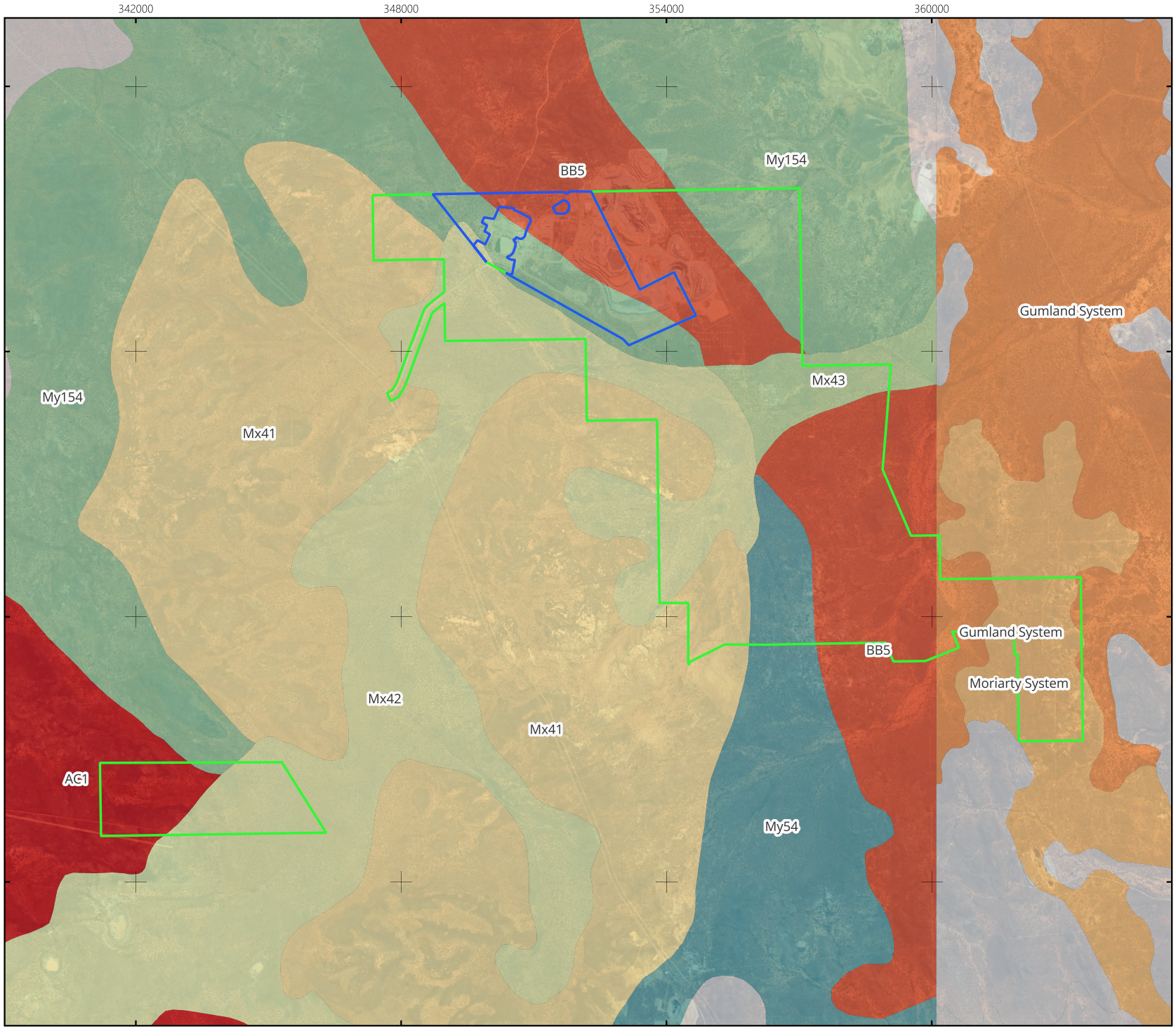
## 1.8. Land Systems

The Land Systems of Western Australia have been mapped at a scale of 1:250,000 (DAFWA 2016). A total of nine Land Systems were mapped across the Survey Area (Table 1.3; Map 1.4), with the BB5 and Mx42 Land Systems being most dominant covering 31.8% and 20.2% of the Survey Area, respectively. The My154 Land System was the next dominant covering 14.1% of the Survey Area. The remainder of the Survey Area was covered by Land Systems, Mx41 (9.8%), Moriarty System (6.9%), Mx43 (5.4%), My54 (5.2%), AC1 (4.2%), and Gumland System (2.4%).

The My54 Land System appears to have a low mapped extent in WA (11,025 ha) however, only 4.0% of its total extent occurs within the Survey Area. All other Land Systems are well represented in the region, with the My154 Land System having the next lowest extent mapped in WA (85,931 ha).

Table 1.3: Land Systems

| Description | Area in Survey Area (ha) | % of Survey Area | Total WA Extent (ha) | % of Total Extent within Survey Area |
|---|---|---|---|---|
| **AC1:** Gently sloping to gently undulating plateau areas, or uplands, on granites, gneisses, and allied rocks, with long gentle slopes and, in places, abrupt erosional scarps | 351.9 | 4.2 | 2,253,031 | <0.1 |
| **BB5:** Rocky ranges and hills of greenstones-basic igneous rocks. | 2,699.4 | 31.8 | 256,642.0 | 1.1 |
| **Gumland System:** Extensive pedeplains supporting eucalypt woodlands with halophytic and non-halophytic shrub understoreys. | 199.3 | 2.4 | 228,800 | 0.1 |
| **Moriarty System:** Low greenstone rises and stony plains supporting chenopod shrublands with patchy eucalypt overstoreys. | 588.7 | 6.9 | 99,584 | 0.6 |
| **Mx41:** Flat to undulating pediments marginal to unit AC1; granitic rock outcrop; some low escarpments. | 832.6 | 9.8 | 175,256 | 0.5 |
| **Mx42:** Broad flat to undulating valleys with isolated granitic rock outcrops and some low escarpments; some seasonal lakes and clay pans. | 1,713.8 | 20.2 | 282,221.0 | 0.6 |
| **Mx43:** Gently undulating valley plains and pediments; some outcrop of basic rock. | 455.7 | 5.4 | 1,870,520 | <0.1 |
| **My154:** Undulating country on acid volcanic rocks and sedimentary materials. | 1197.8 | 14.1 | 85,931 | 1.4 |
| **My54:** Broad very gently undulating plains with scattered rock outcrops occurring as mesas. | 439.4 | 5.2 | 11,025 | 4.0 |




## Legend

- MinRes Survey Area
- M15/717 Survey Area

**Land System**

- AC1
- BB5
- Gumland System
- Moriarty System
- Mx41
- Mx42
- Mx43
- My154
- My54
- Land Systems Not in SA

N

0 1 2 3 4 km

Scale 1:120,000 @ A4

Coordinate System: GDA 2020 MGA Zone 51
Projection: Universal Transverse Mercator
Units: Metre

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Author: ZG

Date: 07-09-2024

# Land Systems

Mt Marion - MinRes & M15/717 Tenements - Detailed Flora & Vegetation Assessment

MAP

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1.4

## 1.9. Significant Lands

Fourteen significant lands are located in the desktop Study Area (within 50 km of the Survey Area). These are listed in Table 1.4 and displayed on Map 1.1 and are described in the following sections.

Table 1.4: Environmentally Significant Areas within the Study Area

| Reserve Name (Protected Area ID) | Distance from Survey Area (km) |
|---|---|
| Conservation Estate | |
| Kambalda Nature Reserve | Within Survey Area |
| Yallari Timber Reserve | 0 km (adjacent to boundary) |
| Scahill Timber Reserve | 4.0 km west |
| Kangaroo Hills Timber Reserve | 9.5 km east |
| Kurrawang Nature Reserve | 13.0 km north |
| Lakeside Timber Reserve | 18.5 km north |
| Burra Conservation Park | 23.5 km south |
| Goldfields Woodlands Conservation Park | 24.3 km southwest |
| Kalgoorlie Arboretum | 27.6 km north |
| Victoria Rock Nature Reserve | 35.9 km southwest |
| Goldfields Woodlands National Park | 44.8 km west |
| Dordie Rocks Nature Reserve | 45.1 km south |
| TECs/PECs | |
| 0 | - |
| Environmentally Sensitive Areas | |
| 2 | 35.9 km southwest |
| Wetlands | |
| 0 | - |

### 1.9.1. Conservation Estate

The Western Australian conservation estate includes land and waters vested in the Conservation and Parks Commission under the Conservation and Land Management Act (Department of Biodiversity Conservation and Attractions, 1984). The conservation estate is generally managed by the Department of Biodiversity, Conservation and Attractions (DBCA) to protect Western Australia's biodiversity and includes National Parks, Nature Reserves, Conservation Reserves, and other areas managed primarily for biodiversity conservation (Department of Climate Change Energy the Environment and Water, 2022). A total of 12 Conservation Reserves occur within the desktop Study Area, including one that intersects a small section in the south-east of the Survey Area, Kambalda Nature Reserve, and one adjacent to the boundary of the Survey Area, Yallari Timber Reserve (Table 1.4; Map 1.1).

### 1.9.2. Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESA) are defined by the Department of Water and Environmental Regulation (Department of Water and Environmental Regulation, 2019) as:

- A defined wetland and the area within 50 m of a wetland;
- The area covered by vegetation within 50 m of Threatened flora, to the extent to which the vegetation is continuous with the vegetation in which the Threatened flora is located;

- The area covered by a Threatened Ecological Community (TEC);
- A Bush Forever site;
- Areas covered by the Gnangara Mound Crown Land Policy and Western Swamp Tortoise Policy; and
- Areas covered by lakes, wetlands, and fringing vegetation of the Swan Coastal Plain Lakes Policy, including South-west Agricultural Zone Wetlands Policy and Swan and Canning Rivers Policy.

There are two ESAs located within the desktop Study Area (Table 1.4; Map 1.1).

### 1.9.3. Australian Wetlands Database

The Australian Wetlands Database includes nationally significant wetlands (as listed in the directory of important wetlands), wetlands listed under the Ramsar convention, wetlands that are representative, rare, or unique, or wetlands that are considered of international importance (Department of Climate Change Energy the Environment and Water, 2019).

No nationally significant wetlands, including Ramsar wetlands, were mapped within the desktop Study Area. The closest wetland of national significance is the Rowles Lagoon System which is located 64.1 km to the northwest (Table 1.4; Map 1.1).

# 2. METHODS

## 2.1. Desktop Assessment

A desktop review of relevant and available biological data sources of the desktop Study Area was undertaken prior to the field survey, to assess the flora and vegetation likely to occur across the Survey Area. The desktop Study Area includes a buffer of approximately 50 km surrounding the Survey Area, or as listed in Table 2.1, and displayed on Map 1.1.

### 2.1.1. Biological Database Searches

The following databases were searched and incorporated into the desktop assessment (Table 2.1).

Table 2.1: Summary of Database Searches

| Data Source | Custodian | Details | Buffer |
|---|---|---|---|
| Commonwealth Protected Matters Search Tool (PMST) | Department of Climate Change Energy the Environment and Water (DCCEEW) | Date: 10/08/2023 | 50 km |
| Dandjoo | Department of Parks and Wildlife / Western Australian Museum (WAM) | Date: 10/08/2023 | 50 km |
| DBCA Threatened & Priority Flora Databases (TPFL / WA Herbarium) | DBCA | Date: 9/08/2023<br>Reference: 17-0823FL | 85 km |
| DBCA Communities Database | DBCA | Date: 11/08/2023<br>Reference: 09-0823EC | 100 km |
| Index of Biodiversity Surveys and Assessments (IBSA) Database | Department of Water and Environmental Regulation (DWER) | Date: 10/08/2023 | 50 km |
| Previously conducted biological assessments | Various sources | Date: 10/08/2023 | 50 km |

### 2.1.2. Literature Review

Previously conducted assessments within the desktop Study Area were reviewed for significant flora and vegetation (Table 2.2). Reports were incorporated if they were provided by MinRes, or if they were publicly available.

Table 2.2: Previously Conducted Biological Assessments

| Biological Assessment Name | Survey Level | Survey Timing | Distance to Survey Area |
|---|---|---|---|
| Reconnaissance Flora and Vegetation Survey for the Mt Marion Project Area (Native Vegetation Solutions, 2019) | Reconnaissance – flora. | May 2012 – Jul 2018 | 0 km |
| Mt Marion Project Reconnaissance Flora and Vegetation Assessment (ecologia, 2022) | Reconnaissance – flora. | Oct 2021 | 0 km |
| WestGold Location 53 East Flora and Fauna Assessment (GHD, 2018) | Detailed – flora;<br>Detailed – fauna. | Mar 2018 | 0 km |
| Reconnaissance Flora and Vegetation Survey of the Spargos Project (Native Vegetation Solutions, 2020) | Reconnaissance – flora. | Oct 2020 | 7 km S |

| Biological Assessment Name | Survey Level | Survey Timing | Distance to Survey Area |
|---|---|---|---|
| Evolution Mining Targeted Flora Calandrinia Memo (Spectrum Ecology & Spatial, 2019) | Targeted – flora. | Nov 2019 | 20 km N |
| Flora and vegetation survey for Mungari Gold Operations Cutters Ridge Project (Phoenix Environmental Sciences, 2019) | Detailed – flora. | Jun & Oct 2018 | 20 km N |

### 2.1.3. Likelihood of Occurrence of Significant Flora

The following information was collated for each significant flora taxon or TEC/PEC identified during the desktop assessment:

- Conservation status (EPBC Act, BC Act, DBCA listing);
- Description of species and flowering period;
- Description of habitat requirements;
- Description of previous records; and
- Distance of record to the Project.

A likelihood of occurrence assessment was then conducted using the criteria listed in Table 2.3. This included assessing the distance of the record from the Project (historical database records considered not accurate were excluded if required), presence of appropriate habitats within the Survey Area (using geology, vegetation mapping, and/or aerial imagery).

Table 2.3: Likelihood of Occurrence Criteria

| Likelihood | Flora & Vegetation |
|---|---|
| Recorded | Species or vegetation community accurately recorded within the Survey Area during the literature review (includes TEC/PEC buffers that intersect). |
| High | Species or vegetation community recorded within 10 km near the Survey Area, and suitable habitat does, or is likely, to occur. |
| Medium | Species or vegetation community recorded outside the Survey Area but within 30 km and suitable habitat may occur. |
| Low | Species or vegetation community rarely or not recorded within 50 km of the Survey Area and suitable habitat is not likely to occur within the Survey Area. |

## 2.2. Rainfall & Survey Timing

Phase 1 (primary season) was undertaken in spring from the 26 September to 2 October 2023 and Phase 2 (secondary season) of the survey was undertaken in autumn from the 3 April to the 15 April 2024. Rainfall data was extracted from the Scientific Information for Land Owners (SILO) database (Queensland Government, 2024)for the centre of the Mt Marion Study Area (-30.78, 121.45). SILO sources climatic data from the Bureau of Meteorology (BOM) and interpolates data between weather stations to provide a complete data set for any location. Figure 2 represents the total monthly rainfall for 2023 to 2024 with the monthly long-term median rainfall. The BOM reference climate normal period of January 1961 to December 1990 was used for calculating climate statistics and evaluating rainfall conditions recorded prior to the survey (Bureau of Meteorology, 2024a). Rainfall conditions were considered 'typical' if the total rainfall recorded over a period was between the 25$^{th}$ and 75$^{th}$ percentiles, for annual rainfall this range was 192.8 mm to 315 mm. Rainfall totals outside of the typical range were considered 'dry' or 'wet', and 'very dry' or 'very wet' if they were below the 10$^{th}$ or above the 90$^{th}$ percentiles, respectively (Bureau of Meteorology, 2024b). The following data was recorded:

### Phase 1 (26/09/2023):

In the year preceding the phase 1 survey, 191.5 mm of rainfall was recorded at the site, 83.9 mm lower than the median of the long term total annual rainfall (275.9 mm) for the same period.

A total of 75.4 mm of rainfall was recorded in the three months prior to the survey (26 June to 26 September 2023), 17.9 mm higher than the median of the long-term total rainfall (57.55 mm) for the same period.

The rainfall conditions were typical for the three months preceding the phase 1 survey and dry compared to the annual conditions of the climate reference period.

### Phase 2 (03/04/2024):

In the year preceding the phase 2 survey, 217.4 mm of rainfall was recorded at the site, 58.9 mm lower than the median of the long term total annual rainfall (275.9 mm) for the same period.

A total of 109 mm of rainfall was recorded in the three months prior to the survey (3 January to 3 April 2024), 61.4 mm higher than the median of the long-term total rainfall (47.6 mm) for the same period.

The rainfall conditions were seasonally wet for the three months preceding the phase 2 survey and typical compared to the annual conditions of the climate reference period and may have been more favorable for plant growth than usual.

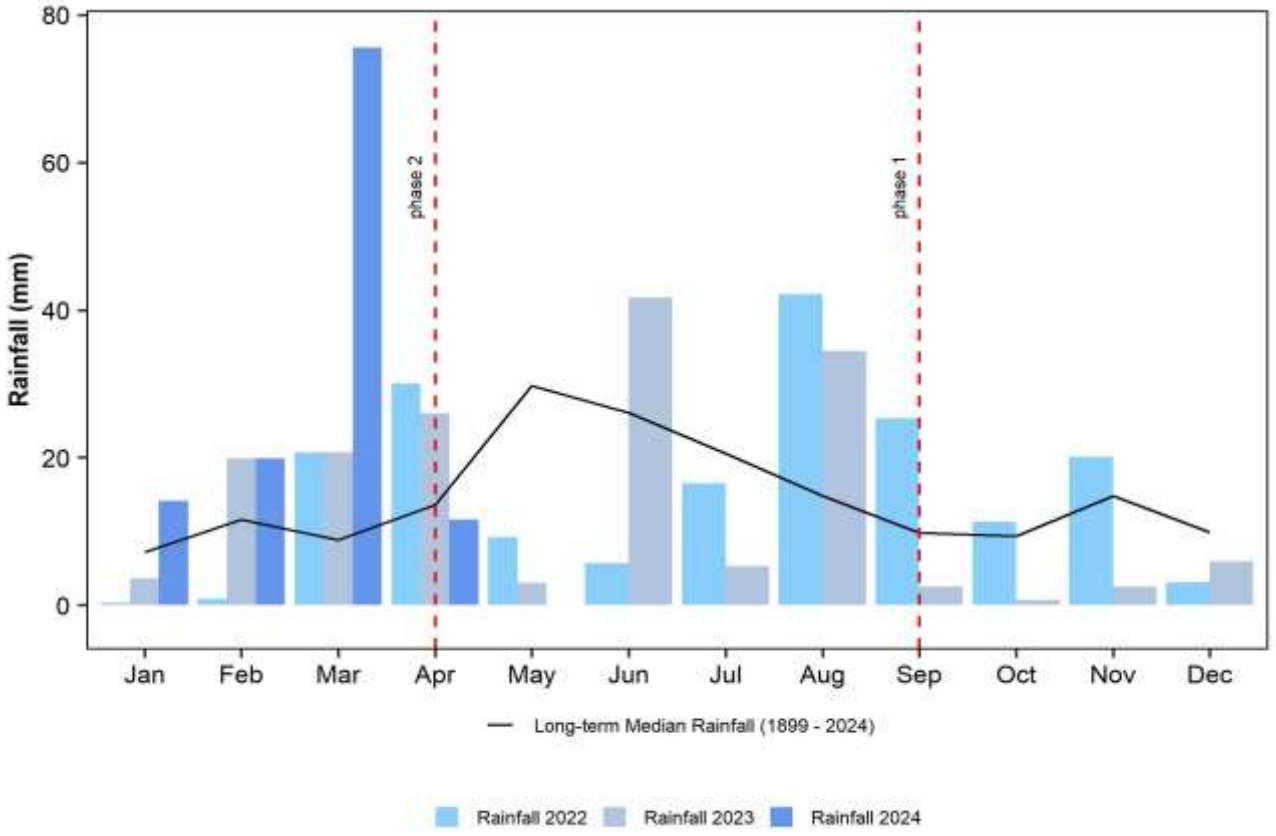



Figure 2.1. Rainfall Data at SILO Request Location (-30.78, 121.45)

The Coolgardie bioregion is considered part of the Southwestern Interzone Botanical province and recommendations are to conduct the primary flora and vegetation survey in spring from September to November and the secondary survey following rain in autumn from March to May (EPA 2016b). The field survey timing was therefore conducted in accordance with EPA recommendations.

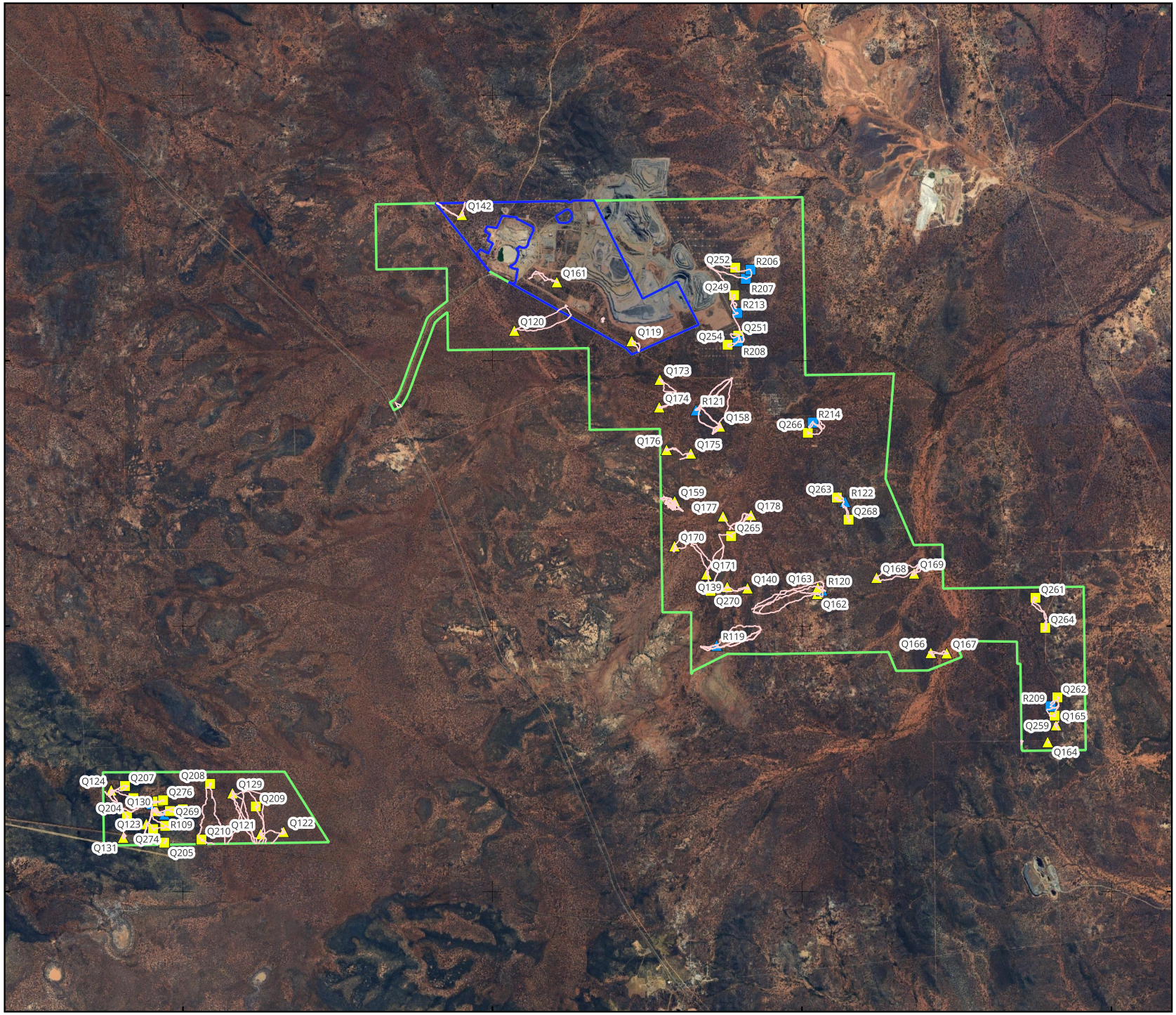
## 2.3. Field Methods & Sampling Effort

A two-phased detailed flora and vegetation assessment was undertaken at the Survey Area. The survey was competed by six botanists across the two phases for a total of 64 field days (40 person-days in phase 1 and 24 person-days in phase 2).

There were a total of 57 quadrats (31 phase 1, 26 phase 2), 12 relevés (6 phase 1, 6 phase 2), and 202.8 km of targeted traverses sampled during the two phased survey (Map 2.1). This was considered appropriate for a reconnaissance level survey as stipulated in the technical guidance (Environmental Protection Authority, 2016b) these techniques are described in Table 2.4. Comprehensive flora site data collection information is included in Appendix B.

Table 2.4: Flora & Vegetation Survey Technique

| Technique | Application & Purpose |
|---|---|
| Quadrats | Quadrats are comprehensive survey technique for gathering information for detailed flora and vegetation survey. Each vegetation unit must be represented by a minimum of three quadrats where possible and have at least one corner permanently marked. Information collected at each quadrat include:<br>• Site code, date; GPS coordinates; botanist;<br>• Size and shape of quadrat (quadrats are 20 x 20 m or 400 $m^2$ for Coolgardie IBRA region);<br>• Photograph from north-west corner;<br>• Landform, including; slope, aspect, soil description and rock type;<br>• Time since fire (quadrats are not sampled if quadrats have a recent fire history);<br>• Vegetation condition (quadrats are not installed if not in a 'Good' or better condition (section 0);<br>• Description of disturbance types;<br>• Vegetation description (NVIS Level V);<br>• Comprehensive species list, canopy cover (%) and height (m). |
| Relevés | Relevés are a low intensity survey technique for gathering information where vegetation is in 'Degraded' or 'Completely Degraded' vegetation condition, recently burnt areas, or where it is too unsafe to survey using a quadrat (cliff faces etc.). Information collected at each relevé includes:<br>• Site code, date, GPS coordinates, botanist;<br>• A photograph;<br>• Vegetation condition and disturbances (including fire);<br>• Landform including; slope, soil, rock type, aspect;<br>• Vegetation description (NVIS Level V);<br>• Dominant species list, canopy cover (%) and height (m); and<br>• Significant flora, weeds. |
| Traverses | A traverse is an unmarked route along which data is collected. Traverses are useful for identifying the boundaries and characteristics of vegetation types, selecting sites for detailed survey, and targeting significant flora or vegetation. Information recorded along a traverse is as for the relevé, with the addition of noting vegetation changes and relationships between vegetation and substrate. |
| Opportunistic Sampling | Flora and vegetation not recorded through other sampling methods is opportunistically sampled as encountered in the Survey Area. |




## Legend

- MinRes Survey Area
- M15/717 Survey Area

**Phase 1 Sample Sites**

- Quadrat
- Releve

**Phase 2 Sample Sites**

- Quadrat
- Releve
- Traverses

N

0 1 2 3 4 km

Scale 1:120,000 @ A4

Coordinate System: GDA 2020 MGA Zone 51
Projection: Universal Transverse Mercator
Units: Metre

Spectrum ECOLOGY • SPATIAL

Author: ZG

Date: 19-09-2024

# Sampling Effort

Mt Marion - MinRes & M15/717 - Detailed Flora & Vegetation Assessment

MAP

Prepared for
Mineral Resources Limited

2.1

## 2.4. Reporting & Data Analysis

### 2.4.1. Flora Nomenclature, Taxonomy & Lodgement

Flora nomenclature used in this report is consistent with the Western Australian Herbarium's (WAH) plant census, provided on FloraBase (Western Australian Herbarium, 2024) and is current at the time of report preparation.

At least one specimen of each flora taxon was collected to confirm all species recorded during the assessment and to investigate any suspected flora of significance (Threatened and Priority Flora and novel taxa).

Specimens were identified using the appropriate taxonomic keys and relevant taxonomic experts at the WAH were consulted as required. Applicable specimens will be vouchered with the WAH as per guidance; including one per species of Threatened or Priority Flora, new occurrences of TECs or PECs, individuals that have atypical characteristics, or bioregional range extensions.

### 2.4.2. Vegetation Mapping

Vegetation mapping was undertaken for a larger project area that encompassed the Survey Area within. The data collected from quadrats, relevés, and traverses, as well as general field notes, observations and aerial photography from the larger project, were used to map the vegetation across the Survey Area. The vegetation was described to NVIS Level V – association (referred to as a 'vegetation types (VT)' for the local scale in this report). This level of description provides information on the dominant growth form, height, and cover for up to three species for each of the upper, mid, and ground strata (ESCAVI, 2003).

The VTs were defined floristically, where quadrats were statistically classified according to similarities in species composition. The statistical analysis was performed in R Core Team (R Core Team, 2021) using the "stats" and "vegan" (Oksanen *et al.*, 2022) packages. Dissimilarity indices were calculated using the vegdist function with the Jaccard index on a binary species matrix. Hierarchical clustering was performed using the hclust function using the 'average' or unweighted pair group with arithmetic mean (UPGMA) method. Figures of the hierarchical clustering were produced using the "dendextend" package (Galili, 2015).

Sites were excluded from the analysis if they were sampled on mosaic vegetation or had low perennial species diversity. A total of 143 quadrats were used in the analysis which included 69 phase 1 quadrats and 74 phase 2 quadrats. Of these, 26 phase 1 and 25 phase 2 quadrats were within the MinRes-M15/717 Survey Area. The following data preparation steps were undertaken prior to the floristic analysis:

- Subspecies, varieties, and some species were combined where difficult to differentiate in the field;
- Annual taxa, herbs, short-lived perennials, and rhizomatous perennials were removed; and
- Only taxa with their taxonomy resolved to at least species level were included, unless they were the only species recorded in that genus.

The combined site by species matrix used for this analysis has been provided electronically.

Due to the size of the Survey Area, extrapolation of the vegetation types was required in areas where there was an absence of quadrats, relevés or field notes. In addition to this, area calculations for vegetation mapping and condition may vary (+/- 0.1%) compared to the Survey Area extent. This is because shapefiles do not contain an x,y tolerance and can impact the accuracy of shapefile vertices. This inefficiency is only noticeable when dealing with large numbers of features, as is the case for the size of the Survey Area.

### 2.4.3. Vegetation Condition

Vegetation condition was recorded at quadrats, relevés and while walking traverses where areas of different vegetation condition were observed. The vegetation condition was scored using the scale recommended for the Interzone Botanical Province as shown in **Error! Reference source not found.** (Environmental Protection Authority, 2016b). Areas with no vegetation present (roads, tracks, infrastructure areas) have been mapped as 'Completely Degraded'.

Table 2.5: Vegetation Condition Scale & Criteria

| Condition | Disturbance Criteria – Southwestern Interzone Botanical Province |
|---|---|
| Pristine | Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement. |
| Excellent | Vegetation structure intact disturbance affecting individual species and weeds are no-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks. |
| 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. |
| Good | Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it, Disturbance to vegetation caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback, and grazing. |
| 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. |
| 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. |

### 2.4.4. Significant Flora & Vegetation Definitions

As defined by the (Environmental Protection Authority, 2016a) Environmental Factor Guideline, flora and vegetation can be considered significant for a range of reasons (Table 2.6; Appendix A). In addition to these definitions, flora and vegetation that are susceptible to impacts are included and discussed as significant, i.e. Groundwater Dependant Ecosystems (GDE).

Table 2.6: Flora & Vegetation Significance Definitions

| Significant Definitions (Environmental Protection Authority, 2016a) | |
|---|---|
| Flora | • Being identified as Threatened (state listed WC Act and/or nationally listed EPBC Act).<br>• Being identified as Priority species: Priority 1 to 4, (Department of Biodiversity Conservation and Attractions, 2019b).<br>• Locally endemic or association with a restricted habitat type (e.g. surface water or groundwater dependant ecosystems).<br>• New species or anomalous features that indicate a potential new species.<br>• Representative of the range of a species (particularly, at the extremes of range recently discovered range extensions, or isolated outliers of the main range).<br>• Unusual species, including restricted subspecies, varieties or naturally occurring hybrids;<br>• Relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape. |
| Vegetation | • Identified as TEC (state listed WC Act and/or nationally listed EPBC Act).<br>• Identified as PEC(Department of Biodiversity Conservation and Attractions, 2023).<br>• Restricted distribution.<br>• Degree of historical impact from threatening processes.<br>• A role as a refuge.<br>• Providing an important function required to maintain ecological integrity of a significant ecosystem. |

| Significant Definitions (Environmental Protection Authority, 2016a) | |
|---|---|
| | • Vegetation that is highly disturbed can reduce the significance. |

### 2.4.5. Local & Regional Context of Flora & Vegetation

Flora and vegetation recorded during the assessment are then further considered at a local and regional scale. The local area includes the Survey Area and near vicinity, and the regional area includes the IBRA region or subregion. Considerations used to determine the local and regional context of flora and vegetation recorded at the Survey Area are listed in Table 2.7.

Table 2.7: Local & Regional Context Definitions

| Group | Local & Regional Context Considerations | |
|---|---|---|
| Flora | **Local** | |
| | Not locally significant | • Flora taxon well known from the local area.<br>• Landforms/habitat the flora taxon occurs on are widespread through the local area.<br>• Flora taxon may occur across multiple landforms and habitats. |
| | Locally significant | • Flora taxon not well known from the local area.<br>• Landforms/habitat the flora taxon occurs are restricted through the local area.<br>• Flora taxon may occur on restricted habitat type. |
| | **Regional** | |
| | Not regionally significant | • Flora taxon's known distribution extends over the region or sub-region.<br>• Flora taxon's known distribution may span over multiple IBRA regions. |
| | Regionally significant | • Flora taxon's known distribution is only known from few locations across the IBRA region or sub-region.<br>• May be common in the local area, but only known from the Survey Area within the IBRA region or sub-region. |
| Vegetation | **Local** | |
| | Not locally significant | • VTs mapped extent is widespread across the Survey Area or local area.<br>• Landforms/habitat the VT occurs on are widespread in the local area, despite a low mapped area in the Survey Area. |
| | Locally significant | • VTs mapped extent is restricted in the Survey Area.<br>• Landforms/habitat the VT occurs on are restricted in the local area.<br>• VT provides habitat for locally significant flora taxa. |
| | **Regional** | |
| | Not regionally significant | • Determined by comparing VTs to the best available data source. This can include state-wide vegetation mapping (Beard), region specific (if available), land system and/or geology mapping.<br>• VTs are matched with regional mapping units (listed above) that are widespread throughout the IBRA region or sub-region. |
| | Regionally significant | • VTs are matched with regional mapping units (listed above) that are restricted throughout the IBRA region or sub-region.<br>• VT provides habitat for regionally significant flora taxa. |

### 2.4.6. Introduced Flora, WoNS & Declared Plant Categories

The Department of Primary Industries and Regional Development (DPIRD) keeps a database of organisms that are Declared Pests in Western Australia. This database is regulated under the Biosecurity and Agricultural Management (BAM) Act (Government of Western Australia, 2007). The legal status and control requirements for these environmentally significant pests are provided in Appendix A.

There are 32 Weeds of National Significance (WoNS) listed for Australia that have been identified based on their invasive tendencies, impact, potential for spread, and socioeconomic and environmental impacts

(Invasive Plants and Animals Committee, 2017). Each species has a national management strategy and manual available.

## 2.5. Data for the Index of Biodiversity Surveys for Assessment (IBSA)

The EPA required that all biological surveys collecting data on biodiversity will submit the report and associated raw data to IBSA as an IBSA data package. All survey data collected at the Survey Area has been provided electronically to comply with IBSA and MinRes data standards.

## 2.6. Project Team & Licences

Spectrum personnel involved with this assessment are listed in Table 2.8, along with their role and years of experience.

Table 2.8: Project Team & Licences

| Staff | Qualification | Role | Project Tasks | Years of Experience | Flora Licence |
|---|---|---|---|---|---|
| Melissa Hay | BSc (Hons) | Principal Botanist | Project management, field survey lead (Phase 1 and 2), data analysis, vegetation mapping, reporting, quality control | 17 | FB62000006-2 |
| Scott Hitchcock | BSc | Principal Botanist | Project management, field survey (Phase 1), reporting, quality control | 19 | FB62000561 |
| Susan Murrey | BSc, MSc | Senior Botanist | Field survey (Phase 1) | 5 | FB62000101-1b |
| Emily Crowther | BSc, MSc | Botanist | Field survey (Phase 1) | 3 | FB62000330 |
| Zane Gates | BSc | Botanist | Field survey (Phase 1 and 2), data analysis, reporting | 2 | FB62000426-2 |
| Chris Urbanek | BSc | Spatial Ecologist | Field survey (Phase 1) | 5 | FB62000420 |
| Dr Udani Sirisena | PhD | Taxonomist | Plant identifications (Phase 1 and 2) | 11 | - |
| Raimond Orifici | BSc (Hons) | Taxonomist | Plant identifications (Phase 1 and 2) | 22 | - |

## 2.7. Limitations & Constraints

Survey specific limitations and constraints for the flora assessment at the Survey Area are discussed in Table 2.9.

Table 2.9: Survey Limitations & Constraints

| Limitation | Constraint | Comment |
|---|---|---|
| Availability of the contextual information at a regional and local scale. | No | There was no regional vegetation mapping available, however Beard vegetation, geology and land system mapping were used to determine regional significance of VTs.<br>Database searches provided detailed information, adequate to guide field survey design and effort for the flora survey. There were multiple assessments conducted within and in the vicinity of the Survey Area and have been included in the desktop assessment. |
| Competency/experience of the consultant carrying out the survey including experience in bioregion surveyed. | No | Principal Botanist Melissa Hay (field team lead on both phases) and Scott Hitchcock have extensive knowledge and experience conducting botanical surveys in the Coolgardie IBRA region of WA. Additionally, the remainder of the team have suitable knowledge in conducting botanical surveys in WA with some experience in the Coolgardie IBRA region and were paired with more experienced personnel when necessary. |

| Limitation | Constraint | Comment |
|---|---|---|
| Timing/weather/season/cycle. | No | The field survey timing of both phases were considered appropriate for a flora and vegetation survey conducted in the Interzone Botanical province where the appropriate timing for a primary survey is spring (September to November) and for the secondary survey is following rain in Autumn from March to May. There was slightly lower than median rainfall at the Survey Area in the three months prior to the Phase 1 survey, however conditions were favourable for flora species growth . Rainfall was higher than the median rainfall in the preceding months of the Phase 2 survey, and the conditions were likely favourable for flora species growth. |
| Disturbances (e.g., fire, flood, accidental human intervention) which affected results of survey. | Potential | Fire disturbances were seen in the south-western part of the Survey Area. No quadrats were placed in this area which may have affected the results of the flora assessment. |
| Remoteness and/or access problems. | Potential | There were some sections of the Survey Area that were too far from tracks to walk, however vegetation was extrapolated confidentiality in these areas using aerial imagery.<br>Heritage areas were avoided during the survey; however, this did not affect the results of the survey. |
| Flora Specific | | |
| Survey effort and extent. | No | The 162 (57 within Survey Area) quadrats and 36 (12 within Survey Area) relevés recorded from the combined surveys efforts at Hamptons tenement (Spectrum Ecology & Spatial, 2024) and the Survey Area were sufficient to map and classify the vegetation for a detailed level survey. All VTs were adequately sampled using a proportionally stratified approach. VTs with less than three quadrats sampled all had very low mapped extents (VT01: 36 ha, VT09: 71 ha, VT12: 9 ha) and were often sampled additionally with relevés to increase sampling effort.<br>There were 202.5 km of traverses undertaken searching for Threatened and Priority Flora within the Survey Area (with an additional 328.5 km in the Hamptons Survey Area (Spectrum Ecology & Spatial, 2024). Previously recorded locations of significant flora were visited, where possible, and re-confirmed. |
| Proportion of flora recorded and/or collected, any identification issues. | No | At least one specimen of every flora species encountered was collected for confirmation. SAC analysis suggested that 76.6% of the taxa expected to be present were recorded within the combined quadrats from the Hamptons Survey Area (Spectrum Ecology & Spatial, 2024) and the Survey Area. An additional 206 taxa were recorded in relevés and opportunistic sampling.<br>Plants were identified by taxonomists Raimond Orifici and Udani Sirisena who have sufficient botanical and taxonomic experience throughout WA and the Coolgardie bioregion. Phase 1 Tecticornia specimens were identified by Dr. Kelly Shepherd at the WAH and Phase 2 Tecticornia specimens were identified by Raimond Orifici due to Dr. Kelly Shepherd's absence. There were 16 specimens that were unable to be conclusively identified, which was attributed to insufficient material and plants being sterile. |

# 3. RESULTS & DISCUSSION - FLORA

## 3.1. Desktop Assessment

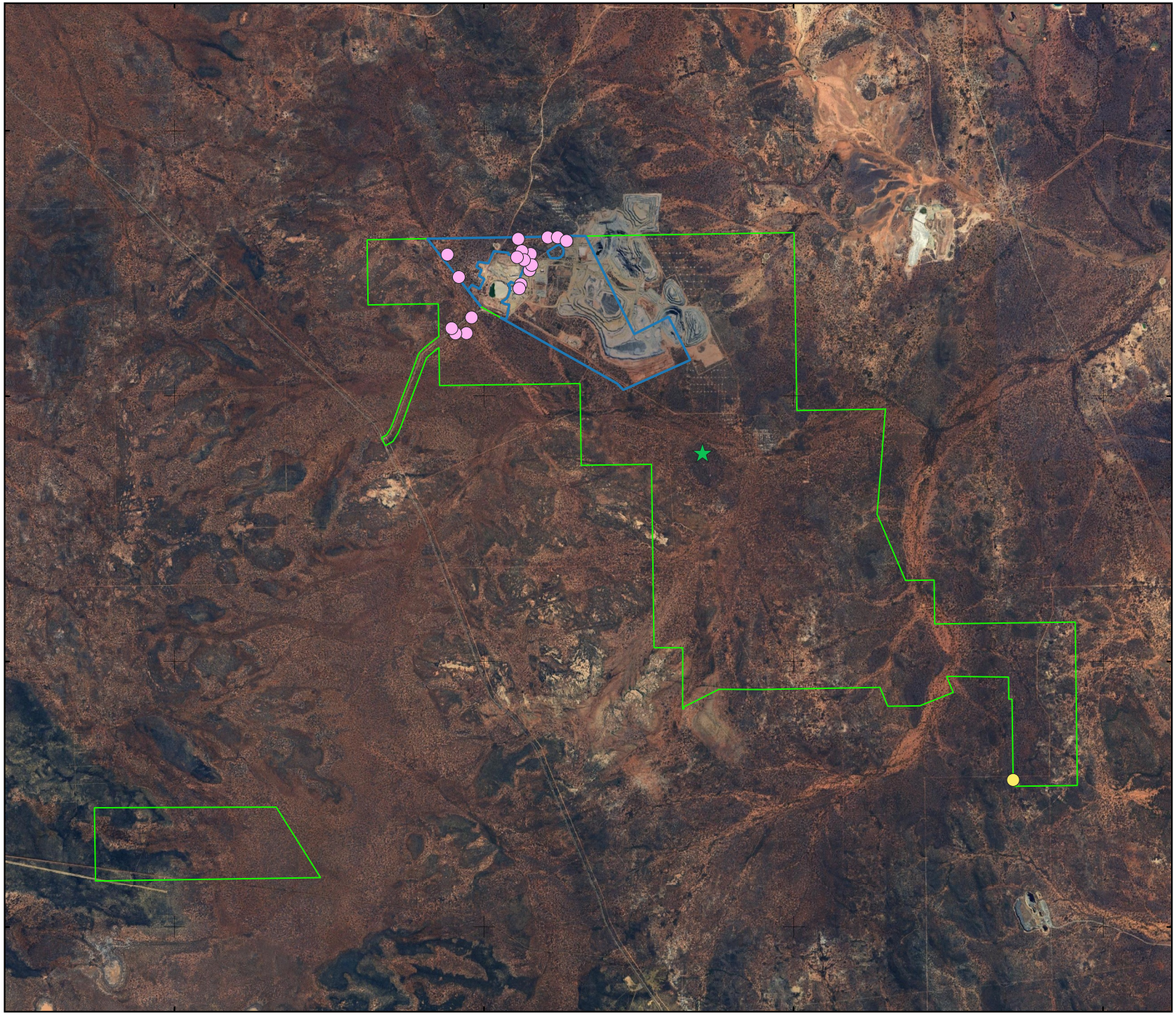
No Threatened flora species were reported from within the Survey Area during the desktop assessment. Two potential Threatened species were identified during the desktop assessment and were assigned a 'High' and 'Low' likelihood of occurrence in the Survey Area (Table 3.1; Appendix C).

Three Priority Flora taxa have previously been recorded in the Survey Area. A total of 63 further Priority Flora taxa were also identified, 18 of which are considered to have a 'High' likelihood and 22 a 'Medium' likelihood of occurrence within the Survey Area (Table 3.1). The remaining 23 taxa have been assigned a 'Low' likelihood of occurrence and are listed in Appendix C.

Table 3.1: Desktop Significant Flora – Recorded, High & Medium Likelihood of Occurrence

| Likelihood | Status | Taxa |
|---|---|---|
| Recorded | Priority 1 | *Thryptomene planiflora* |
| | Priority 3 | *Eremophila acutifolia*<br>*Styphelia rectiloba* |
| High | Threatened | *Tetratheca spenceri* |
| | Priority 1 | *Acacia websteri*<br>*Calandrinia lefroyensis*<br>*Cyathostemon divaricatus*<br>*Lepidosperma lyonsii*<br>*Lepidosperma* sp. Parker Range (N. Gibson & M. Lyons 2094)<br>*Pterostylis xerampelina*<br>*Ricinocarpos digynus* |
| | Priority 2 | *Acacia kerryana*<br>*Lepidosperma* sp. Kambalda (A.A. Mitchell 5156)<br>*Phebalium clavatum* |
| | Priority 3 | *Acacia crenulata*<br>*Allocasuarina eriochlamys* subsp. *grossa*<br>*Cratystylis centralis*<br>*Cryptandra crispula*<br>*Eremophila microphylla*<br>*Phlegmatospermum eremaeum*<br>*Stylidium choreanthum* |
| | Priority 4 | *Eremophila caerulea* subsp. *merrallii* |
| | Priority 1 | *Acacia coatesii*<br>*Dampiera plumosa*<br>*Eucalyptus websteriana* subsp. *norsemanica*<br>*Tecticornia mellarium* |
| | Priority 2 | *Austrostipa frankliniae*<br>*Bossiaea laxa*<br>*Eremophila praecox*<br>*Goodenia salina*<br>*Tecticornia flabelliformis* |
| | Priority 3 | *Alyxia tetanifolia*<br>*Austrostipa turbinata*<br>*Bossiaea celata*<br>*Chrysocephalum apiculatum* subsp. *norsemanense* |

| Likelihood | Status | Taxa |
|---|---|---|
| | | *Eremophila veronica*<br>*Grevillea georgeana*<br>*Isolepis australiensis*<br>*Melaleuca coccinea*<br>*Melaleuca macronychia* subsp. *trygonoides*<br>*Notisia intonsa* |
| | Priority 4 | *Eucalyptus jutsonii* subsp. *jutsonii*<br>*Eucalyptus* x *brachyphylla*<br>*Frankenia glomerata* |




## Legend

- M15/717 Survey Area
- MinRes Survey Area

**Desktop Flora**

- P1-Thryptomene planiflora
- P3-Eremophila acutifolia
- P3-Styphelia rectiloba

N

0 1 2 3 4 km

Scale 1:120,000 @ A4

Coordinate System: GDA 2020 MGA Zone 51
Projection: Universal Transverse Mercator
Units: Metre

Spectrum ECOLOGY • SPATIAL

Author: ZG

Date: 06-09-2024

# Desktop Significant Flora - Recorded in Survety Area

Mt Marion - MinRes & M15/717 - Detailed Flora and Vegetation Assessment

MAP 3.1

Prepared for
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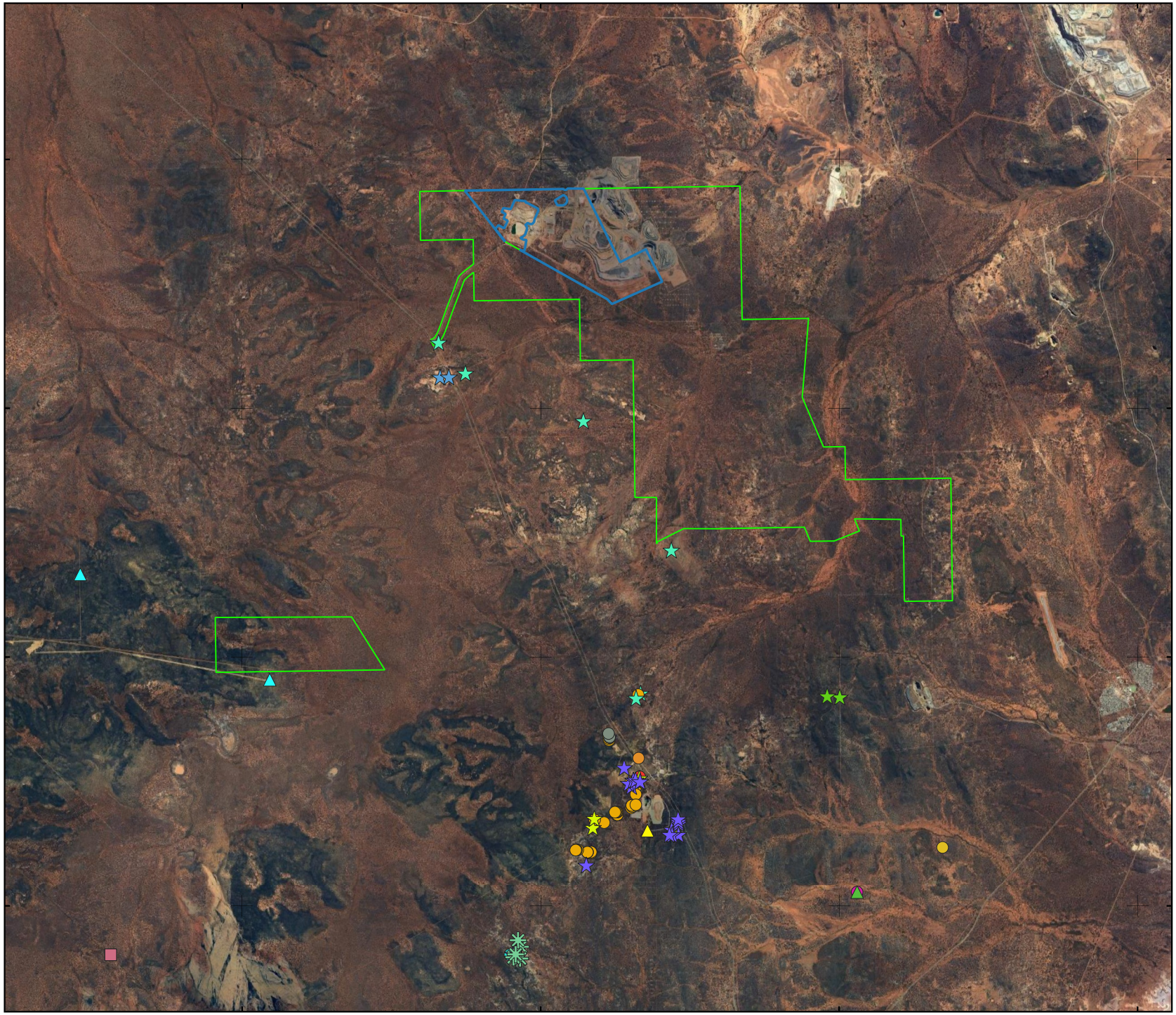



## Legend

- M15/717 Survey Area
- MinRes Survey Area

**Desktop Flora**

- T-Tetratheca spenceri
- P1-Acacia websteri
- P1-Calandrinia lefroyensis
- P1-Cyathostemon divaricatus
- P1-Lepidosperma lyonsii
- P1-Lepidosperma sp. Parker Range (N. Gibson & M. Lyons 2094)
- P1-Pterostylis xerampelina
- P1-Ricinocarpos digynus
- P2-Acacia kerryana
- P2-Lepidosperma sp. Kambalda (A.A. Mitchell 5156)
- P2-Phebalium clavatum
- P3-Acacia crenulata
- P3-Allocasuarina eriochlamys subsp. grossa
- P3-Cratystylis centralis
- P3-Cryptandra crispula
- P3-Eremophila microphylla
- P3-Phlegmatospermum eremaeum
- P3-Stylidium choreanthum
- P4-Eremophila caerulea subsp. merrallii

N

0 1 2 3 4 km

Scale 1:160,000 @ A4

Coordinate System: GDA 2020 MGA Zone 51
Projection: Universal Transverse Mercator
Units: Metre

Spectrum ECOLOGY • SPATIAL

Author: ZG

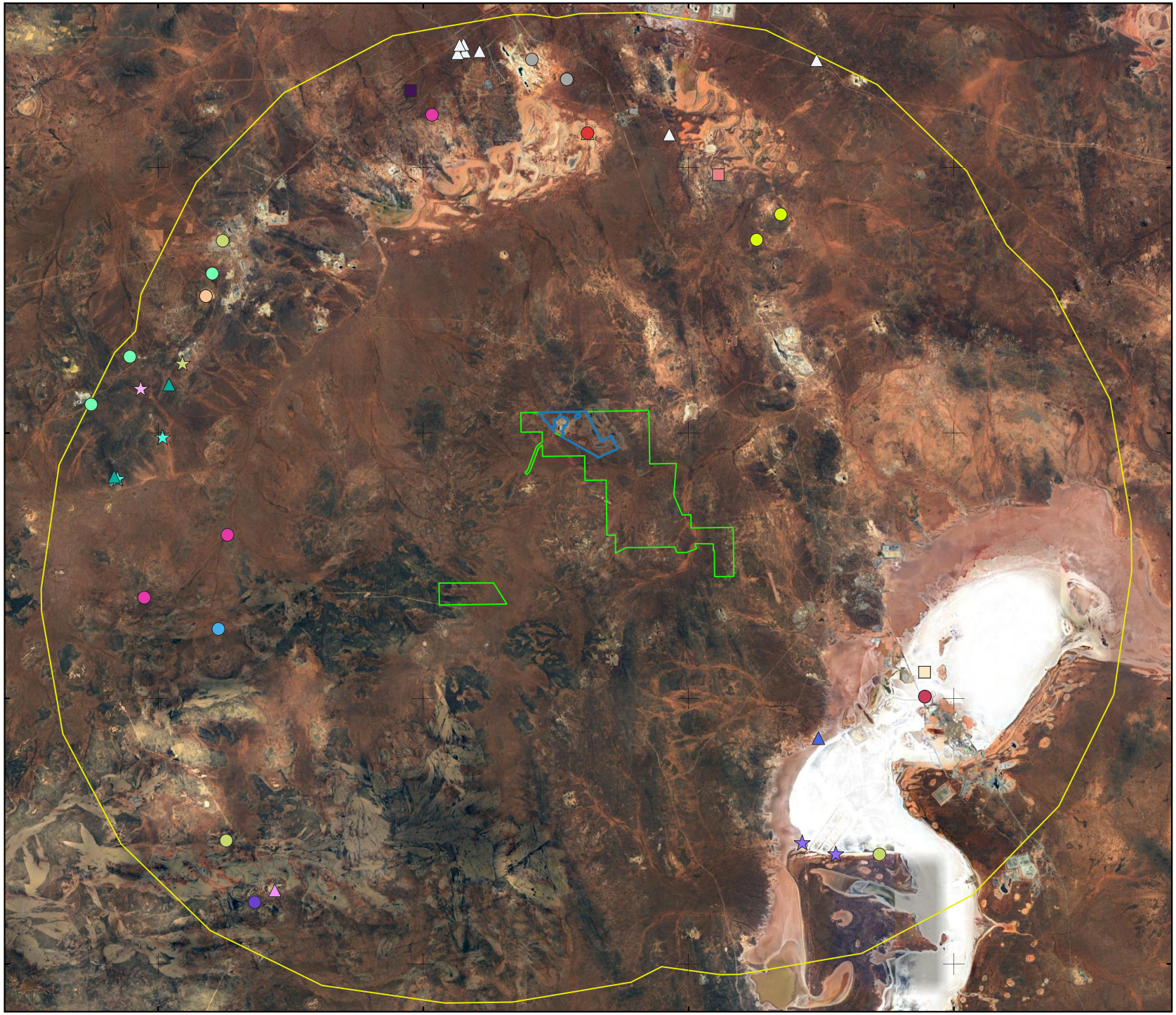
Date: 07-09-2024

# Desktop Significant Flora - 'High' Likelihood

Mt Marion - MinRes & M15/717 - Detailed Flora and Vegetation Assessment

MAP 3.2

Prepared for
Mineral Resources Limited




## Legend

- M15/717 Survey Area
- MinRes Survey Area

**Desktop Flora**

- P1-Acacia coatesii
- P1-Dampiera plumosa
- P1-Eucalyptus websteriana subsp. norsemanica
- P1-Tecticornia mellarium
- P2-Austrostipa frankliniae
- P2-Bossiaea laxa
- P2-Eremophila praecox
- P2-Goodenia salina
- P2-Tecticornia flabelliformis
- P3-Alyxia tetanifolia
- P3-Austrostipa turbinata
- P3-Bossiaea celata
- P3-Chrysocephalum apiculatum subsp. norsemanense
- P3-Eremophila veronica
- P3-Grevillea georgeana
- P3-Isolepis australiensis
- P3-Melaleuca coccinea
- P3-Melaleuca macronychia subsp. trygonoides
- P3-Notisia intonsa
- P4-Eucalyptus jutsonii subsp. jutsonii
- P4-Eucalyptus x brachyphylla
- P4-Frankenia glomerata

N

0 2 4 6 8 10 km

Scale 1:400,000 @ A4

Coordinate System: GDA 2020 MGA Zone 51
Projection: Universal Transverse Mercator
Units: Metre

Spectrum ECOLOGY • SPATIAL

Author: ZG

Date: 07-09-2024

# Desktop Significant Flora - 'Medium' Likelihood

Mt Marion - MinRes & M15/717 - Detailed Flora and Vegetation Assessment

MAP 3.3

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## 3.2. Flora

A total of 239 taxa from 38 families and 114 genera were recorded within the Survey Area and are listed in Appendix D. The most species rich family was Myrtaceae, with 43 species, followed by Fabaceae with 31 species. The most species rich genera were *Acacia* with 23 species, followed by *Eucalyptus* with 20 species. Of the 239 taxa recorded, nine were introduced flora species and 10 were significant flora species (seven Priority Flora and three range extensions; Table 3.2).

Table 3.2: Number of Flora Taxa Recorded

| Total Taxa | Native | Introduced | Total Families | Most Common Families | Total Genera | Most Common Genera | Most Common Taxa Based on % of Quadrats |
|---|---|---|---|---|---|---|---|
| 239 | 230 | 9 | 38 | Myrtaceae – 43<br>Fabaceae – 31<br>Chenopodiaceae– 22<br>Asteraceae - 21 | 114 | *Acacia* – 23<br>*Eucalyptus* - 20<br>*Eremophila* – 15<br>*Maireana* - 9 | *Exocarpos aphyllus* – 61.4%<br>*Scaevola spinescens* – 56.1%<br>*Olearia muelleri* – 54.4%<br>*Alyxia buxifolia* – 47.4% |

### 3.2.1. Species Accumulation Curve

Species accumulation curves show the relationship between sampling effort and the number of species recorded and can therefore be used to discuss sampling adequacy. As sampling effort (quadrats) increases, the rate at which new species are recorded is reduced, and this is used to predict the number of species that are likely to be present within the Survey Area.

A species accumulation curve is presented in Figure 3.1, which was plotted using the *specaccum* function in the vegan package in R v. (R Core Team, 2021) The improved Chao 2 non-parametric species richness estimator (Chiu *et al.*, 2014) was determined at 448 species (95% CI [406, 517), suggesting that 76.6% of flora species were recorded during the survey, based on the 343 recorded taxa within the combined 162 quadrats from the Hamptons tenement survey (Spectrum Ecology & Spatial, 2024) and the Survey Area. Should the additional taxa recorded during opportunistic collections and relevés be included in the total, it is suggested that 87.9% of the flora taxa were collected during the assessment.

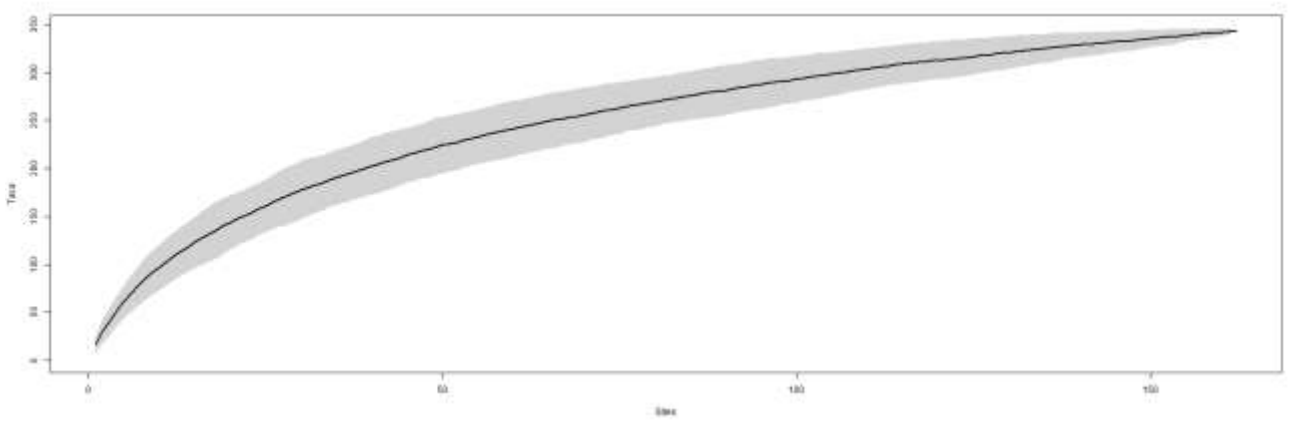


Figure 3.1: SAC – Flora

## 3.3. Significant Flora

No Threatened flora taxa were recorded or considered likely to occur in the Survey Area during the assessment. Seven Priority Flora taxa were recorded within the Survey Area (Table 3.3;

Map 3.4):

- Priority 1 (P1): *Acacia websteri*, *Ptilotus procumbens*, *Thryptomene planiflora*;
- Priority 2 (P2): *Phebalium clavatum;*
- Priority 3 (P3): *Cyathostemon verrucosus*, *Eremophila acutifolia*, *Eucalyptus urna* subsp. *xesta*.

Some records of *Thryptomene planiflora* were assigned a query due to a lack of adequate material to confidently identify the species.

Three range extensions were recorded (section 2.4.4) in the Survey Area during the assessment. *Paspalidium basicladum*, *Santalum murrayanum*, and **Tamarix aphylla*. None of these taxa have previously been recorded within 100 km of the Survey Area.

Multiple Sandalwood (*Santalum spicatum*) populations were recorded from seven locations in the Survey Area. Sandalwood is a controlled species under the BC Act (if it has a diameter of greater than 25 mm at the smallest end when stripped of bark; or roots of sandalwood) and it cannot be taken from private land or from Crown land to be processed without a licence (flora taking (sandalwood) licence) unless an exemption applies (Government of Western Australia, 2018).

No other significant flora taxa, as listed in section 2.4.4, were recorded within the Survey Area during the assessment. Coordinates of all significant flora taxa have been provided electronically with this report.

Table 3.3: Significant Flora

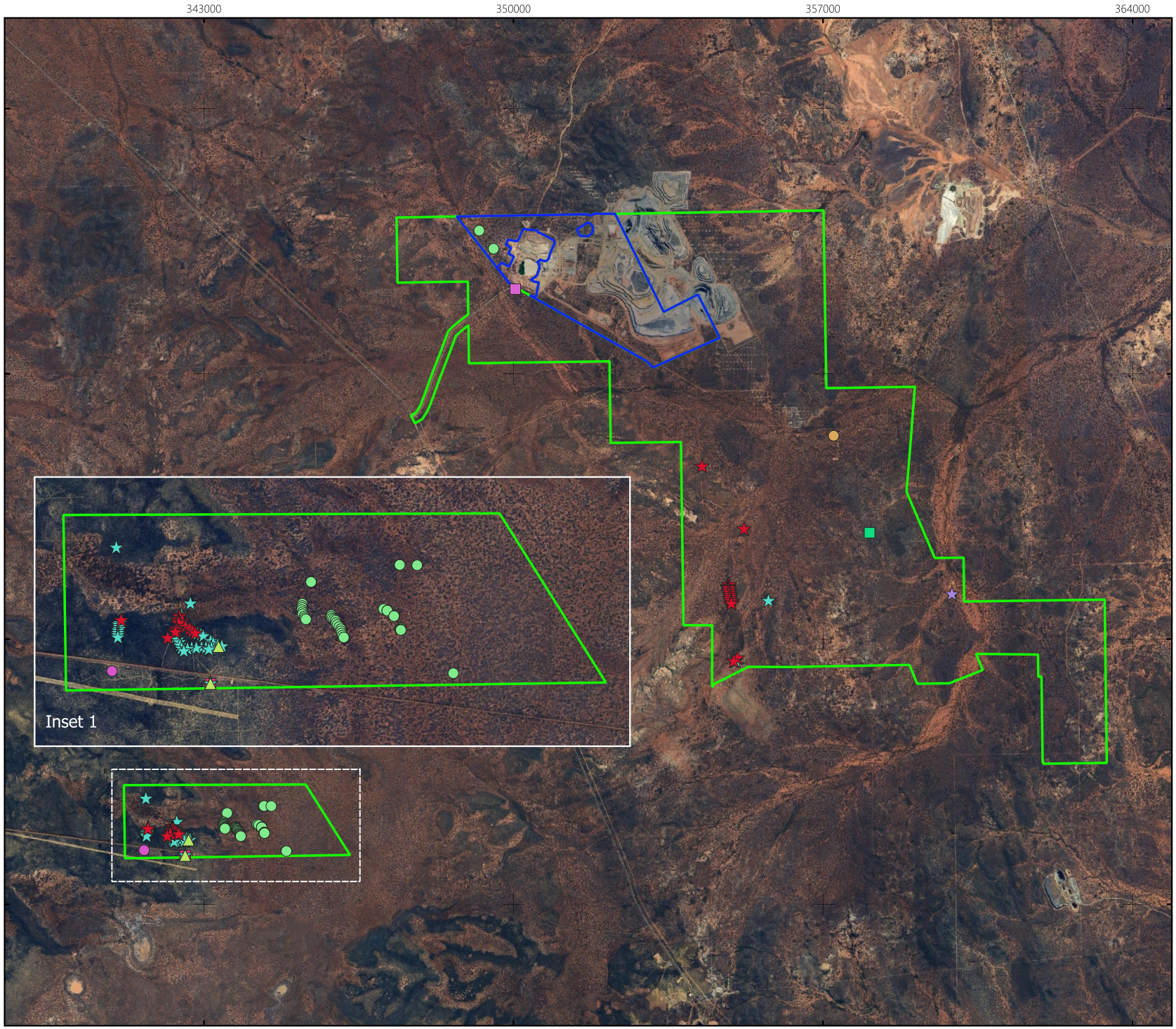
| Status & Taxon | | Description of Species in Survey Area | Description of Habitat in Survey Area | # of Individuals & VTs In Survey Area (% of Individuals in combined Survey Area)* | Map^ | Known Local & Regional Distribution | Photograph |
|---|---|---|---|---|---|---|---|
| P1 | *Acacia websteri* | Shrub, 1.2-5 m high, bark fibrous. Fl. yellow. | Drainage, flats plains and hill crests/slopes with light red orange sand. | **Total: 490**<br><br>**VTs:**<br>VT02: 63 (12.9%)<br>VT11: 426 (86.9%)<br>VT24: 1 (0.2%) |  | **Local**: Known from multiple locations in the local area.<br><br>**Regional**: Known from multiple scattered locations throughout Western Australia: Avon Wheatbelt, Coolgardie, Murchison. |  |
| P1 | *Ptilotus procumbens* | Spreading procumbent annual, herb, ~0.1 m high. Fl. pink, white | Lower hillslopes with red-orange clay. | **Total: 2**<br><br>**VT:**<br>VT15: 2 (100%) |  | **Local**: Known from two locations in the local area.<br><br>**Regional**: Known only from the Coolgardie and Murchison IBRA bioregions of WA. |  |

| Status & Taxon | | Description of Species in Survey Area | Description of Habitat in Survey Area | # of Individuals & VTs In Survey Area (% of Individuals in combined Survey Area)* | Map^ | Known Local & Regional Distribution | Photograph |
|---|---|---|---|---|---|---|---|
| P1 | *Thryptomene planiflora* | Shrub to 0.5-2 m high, broadly, or very broadly obovate leaves with no obvious apical point. Fl white/pink, Jun to Oct. | Recorded on plains, with yellow or brown to red sandy soils, in shrublands that are often dominated by *Acacia*. | **Total**: 8022<br><br>**VTs:**<br><br>VT01: 1 (<0.1%)<br>VT02: 7996 (99.7%)<br>VT11: 5 (<0.1%)<br>VT24: 20 (0.2%) |  | **Local**: Known from multiple locations in the local area.<br><br>**Regional**: Known only from the Coolgardie IBRA bioregion of WA. |  |
| P2 | *Phebalium clavatum* | Erect shrub, 1m high. Flowering white. Alternate leaves, silver scales/hairs present. | Simple hill crest with light yellow sand. | **Total**: 26<br><br>**VTs**:<br><br>VT01: 25 (96.2%)<br>VT02: 1 (3.8%) | | **Local**: Known from multiple locations in the local area.<br><br>**Regional**: Known only from the Coolgardie IBRA bioregion of WA. |  |

| Status & Taxon | | Description of Species in Survey Area | Description of Habitat in Survey Area | # of Individuals & VTs In Survey Area (% of Individuals in combined Survey Area)* | Map^ | Known Local & Regional Distribution | Photograph |
|---|---|---|---|---|---|---|---|
| P3 | *Cyathostemon verrucosus* | Upright shrub to 1m, small warty leaves. Flowers white. | Simple hill crest with cream/yellow sand. | **Total**: 1<br><br>**VT:**<br><br>VT01: 1 (100%) |  | **Local**: Known from multiple locations in the local area.<br><br>**Regional**: Known only from the Coolgardie IBRA bioregion of WA. |  |
| P3 | *Eremophila acutifolia* | Low spreading shrub up to 0.4m high. Flowering pink/white. | Drainage/ depression or flat plains with red-orange sandy clay. | **Total**: 61320<br><br>**VTs:**<br><br>VT17: 22900 (36.5%)<br>VT21: 38420 (61.2%) | | **Local**: Known from multiple locations in the local area.<br><br>**Regional**: Known only from the Coolgardie IBRA bioregion of WA. |  |

| Status & Taxon | | Description of Species in Survey Area | Description of Habitat in Survey Area | # of Individuals & VTs In Survey Area (% of Individuals in combined Survey Area)* | Map^ | Known Local & Regional Distribution | Photograph |
|---|---|---|---|---|---|---|---|
| P3 | *Eucalyptus urna* subsp. *xesta* | Mallet up to 15m high, Bark white/cream/grey and some orange with ribbons, leaves dull, fruits smooth. | Flat plain with light red sand with some ironstone medium gravel. | **Total:** 1<br><br>**VT:**<br><br>VT21: 1 (100%) |  | **Local**: Known from multiple locations in the local area.<br><br>**Regional**: Known from the Avon Wheatbelt, Coolgardie and Mallee IBRA bioregions of WA. |  |

*Percentages calculated using the combined Survey Areas (Spectrum Ecology & Spatial, 2024); ^(Council of Heads of Australasian Herbaria, 2023)




## Legend

- M15/717 Survey Area
- MinRes Survey Area

**Priority Flora**

- P1-Acacia websteri
- P1-Ptilotus procumbens
- P1-Thryptomene planiflora
- P2-Phebalium clavatum
- P3-Cyathostemon verrucosus
- P3-Eremophila acutifolia
- P3-Eucalyptus urna subsp. xesta

**Range Extensons**

- Paspalidium basicladum
- Santalum murrayanum
- Tamarix aphylla*

N

0 1 2 3 4 km

Scale 1:120,000 @ A4

Coordinate System: GDA 2020 MGA Zone 51
Projection: Universal Transverse Mercator
Units: Metre

Spectrum ECOLOGY • SPATIAL

Author: ZG

Date: 19-09-2024

# Significant Flora

Mt Marion - MinRes & M15/717 - Detailed Flora & Vegetation Assessment

MAP

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3.4

### 3.3.1. Local & Regional Context of Significant Flora

*Acacia websteri* (P1) was recorded on drainage, flats plains and hill slopes, with 490 individuals recorded at 33 locations. *Acacia websteri* (P1) is previously known from multiple locations in the local area, including records within the Survey Area. It is also known to occur within the Avon Wheatbelt, Coolgardie, and Murchison IBRA Bioregions and thus isn't considered locally or regionally significant.

*Ptilotus procumbens* (P1) was recorded on a lower hillslope drainage line, with two individuals recorded from one location. *Ptilotus procumbens* (P1) is previously known from only two locations in the local area with one of the locations being in the town of Kalgoorlie Boulder in 1981, and the other recorded north of the Survey Area near Charlie Dam (Western Australian Herbarium, 2024). There are further records north of the Coolgardie IBRA Bioregion in the Murchison IBRA Bioregion, but at a low abundance. Therefore, *Ptilotus procumbens* (P1) should be considered locally and regionally significant.

*Thryptomene planiflora* (P1) was recorded on sandy slopes and plains typically dominated by *Acacia* or *Allocasuarina* species, with 8022 individuals recorded from 40 locations. *Thryptomene planiflora* (P1) is previously known from multiple locations in the local area is common within the Coolgardie IBRA Bioregion. Therefore, *Thryptomene planiflora* (P1) is not locally or regionally significant.

*Phebalium clavatum* (P2) was recorded on simple hillcrests, with 26 individuals recorded from two locations. *Phebalium clavatum* (P2) is previously known from multiple locations in the local area but is regionally restricted to the Coolgardie IBRA Bioregion with only six previous records of the species observed over the last 25 years (Western Australian Herbarium, 2024).Therefore, *Phebalium clavatum* (P2) is not locally significant, but should be considered regionally significant.

*Cyathostemon verrucosus* (P3) was recorded on a simple hillcrest, with one individual recorded in one location. *Cyathostemon verrucosus* (P3) is previously known from multiple locations in the local area and is widespread within the Coolgardie IBRA Bioregion. Therefore, *Cyathostemon verrucosus* (P3) is not considered locally or regionally significant.

*Eremophila acutifolia* (P3) was recorded in drainage, depression areas and plains, with 61320 individuals recorded from 42 locations. *Eremophila acutifolia* (P3) is previously known from multiple locations in the local area including records within the Survey Area and is common regionally within the Coolgardie IBRA Bioregion. Therefore, records of *Eremophila acutifolia* (P3) in the Survey Area are not considered locally or regionally significant.

*Eucalyptus urna* subsp. *xesta* (P3) was recorded on a flat plain, with one individual recorded in one location. *Eucalyptus urna* subsp. *xesta* (P3) is previously known from multiple locations in the local area, mainly east of the Survey Area near Dunbar Rd and Marvel-Loch (Western Australian Herbarium, 2024) and has been recorded in the Avon Wheatbelt, Coolgardie, and Mallee IBRA Bioregions. Therefore, *Eucalyptus urna* subsp. *xesta* (P3) is not considered locally or regionally significant.

### 3.3.2. Post-Survey Review of Desktop Assessment Flora Taxa

Of the two Threatened flora previously recorded in the Study Area (Table 3.1), one, *Tetratheca spenceri* (T), that was assigned a pre-survey likelihood of 'High' was not recorded in the Survey Area and its habitat (breakaway system, lateritic soil with tantalite) not identified. As such the post-survey likelihood has been reduced to 'Low'. The other Threatened flora, *Gastrolobium graniticum* (T), retained its pre-survey likelihood of 'Low' as suitable habitat was identified in the Survey Area, but the species was not recorded.

Of the 18 Priority Flora taxa that were assigned a 'High' likelihood of occurrence prior to the surveys, two were recorded during the current assessment, *Acacia websteri* (P1) and *Phebalium clavatum* (P2). The remaining Priority Flora taxa have been assigned to a "Medium' likelihood of occurrence post-survey as suitable habitat was identified in the assessment, but they were not recorded.

No Priority Flora taxa that were assigned a 'Medium' pre-survey likelihood, were recorded in the assessment. All of these Priority Flora taxa have been assigned to a "Low' likelihood of occurrence post-survey as suitable habitat was identified in the assessment, but they were not recorded.

Two of the Priority Flora assigned a 'Low' pre-survey likelihood, *Ptilotus procumbens* (P1) and *Cyathostemon verrucosus* (P3), were recorded in the Survey Area. The remaining Priority Flora taxa assigned a 'Low' pre-survey likelihood retained their likelihood post-survey as they have been found within 50km of the Survey Area with some habitat match.

One species not identified during the desktop assessment was recorded during the survey. *Eucalyptus urna* subsp. *xesta* (P3) is not known from within 85 km of the Survey Area and therefore was not included in the pre-survey likelihood of occurrence assessment. Its post-survey likelihood has therefore been assigned as 'Recorded.'

Three Priority Flora, *Thryptomene planiflora* (P1), *Eremophila acutifolia* (P3), and *Styphelia rectiloba* (P3), were previously recorded in the Survey Area during the desktop assessment (Table 3.1). Some of the previous records of each of the Priority species were visited and confirmed (

Map 3.4)

Map 3.4: Significant Flora, however the records of *Styphelia rectiloba* (P3) were found to be outside of the Survey Area in the southeast

Map 3.4: Significant Flora. All significant flora post-survey likelihood are detailed in Appendix C.

## 3.4. Introduced Flora

There were nine introduced flora species recorded at the Survey Area, one of which is a Declared Pest and WoNS in WA.

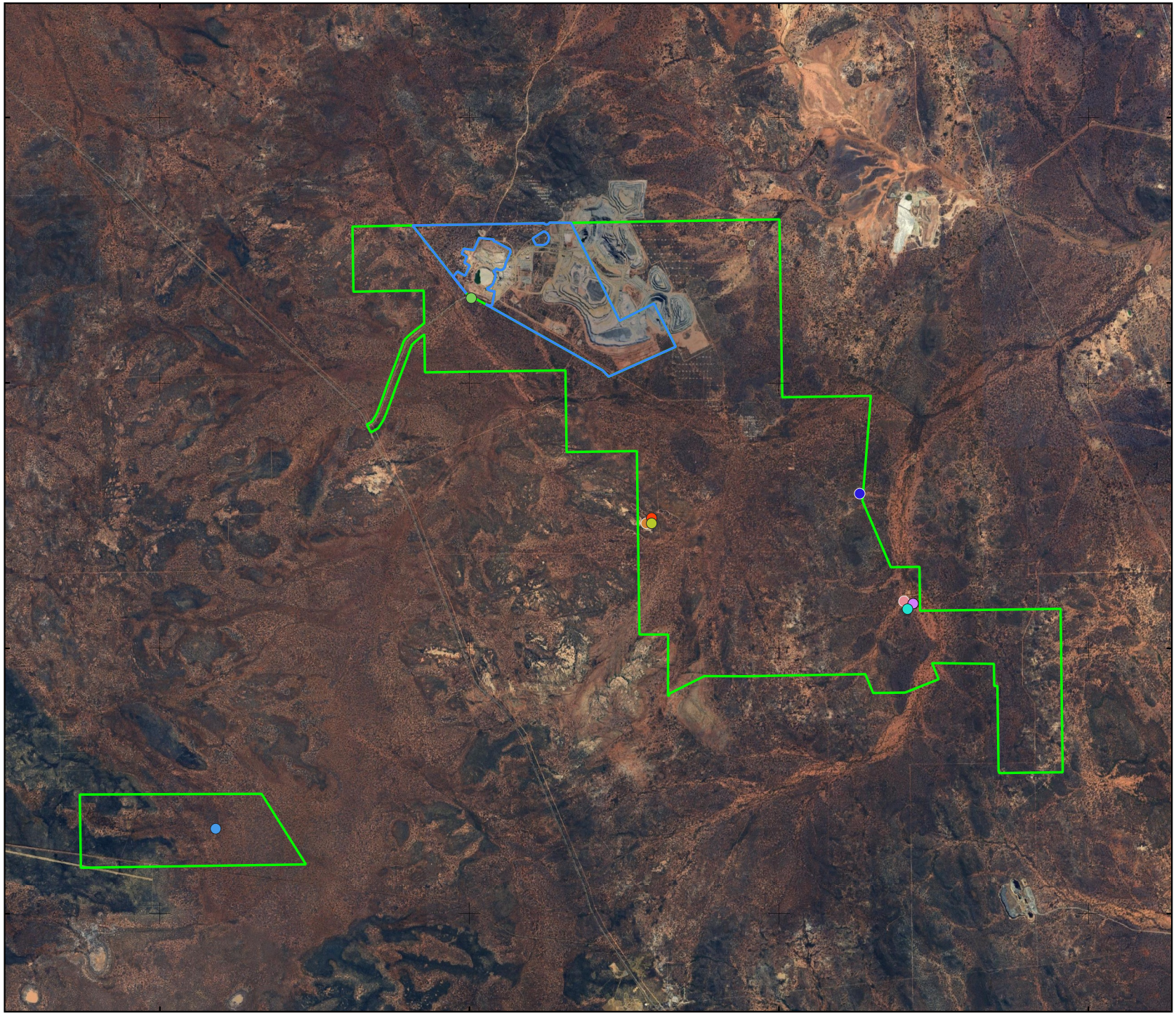
The WoNS, **Tamarix aphylla*, was recorded from one location in the Survey Area at an abundance of one. This species has no control category management requirement in WA (Department of Primary Industries and Regional Development, 2019a).

Of the remaining introduced flora species recorded, none were widespread and were only found in single populations. **Salvia verbenaca*, had the highest abundance in the Survey Area, with an estimated 200 individuals recorded. **Medicago polymorpha* and **Oncosiphon suffruticosum* had the next highest abundance in the Survey Area, with a total abundance of 100 individuals each. Weeds were commonly recorded around disturbed areas, including old mining areas, with the majority of the Survey Area that was not previously disturbed having only scattered individuals present throughout. None of the introduced flora were a dominant species in any of the VTs.

All introduced flora species are listed in Table 3.4. Locations have been provided on Map 3.5 and are provided electronically with the report.

Table 3.4: Introduced Flora

| Species | Abundance at the Survey Area | Environmental Significance |
|---|---|---|
| **Centaurea melitensis* | 5 | Permitted- s11 |
| **Hypochaeris glabra* | 10 | Permitted- s11 |
| **Oncosiphon suffruticosum* | 100 | Permitted- s11 |
| **Pentameris airoides* subsp. *airoides* | 20 | Permitted- s11 |
| **Salvia verbenaca* | 200 | Permitted- s11 |
| **Schismus arabicus* | 1 | Permitted- s11 |
| **Sonchus oleraceus* | 1 | Permitted- s11 |
| **Tamarix aphylla* | 1 | Declared Pest – s22(2) |
| **Vulpia muralis* | 5 | Permitted- s11 |




## Legend

- M15/717 Survey Area
- MinRes Survey Area

**Introduced Flora**

- Centaurea melitensis*
- Hypochaeris glabra*
- Oncosiphon suffruticosum*
- Pentameris airoides subsp. airoides*
- Salvia verbenaca*
- Schismus arabicus*
- Sonchus oleraceus*
- Tamarix aphylla
- Vulpia muralis*

N

0 1 2 3 4 km

Scale 1:120,000 @ A4

Coordinate System: GDA 2020 MGA Zone 51
Projection: Universal Transverse Mercator
Units: Metre

Spectrum ECOLOGY • SPATIAL

Author: ZG

Date: 06-09-2024

# Introduced Flora

Mt Marion - MinRes & M15/717 Tenements - Detailed Flora & Vegetation Assessment

MAP

Prepared for
Mineral Resources Limited

3.5

# 4. RESULTS – VEGETATION

## 4.1. Desktop Assessment

### 4.1.1. TEC/PECs

No TEC/PECs were identified in the desktop review of the Study Area.

### 4.1.2. Literature Review Significant Vegetation

Previously undertaken assessments were reviewed for significant vegetation. No vegetation analogous with any TEC or PECs were recorded in the Study Area, however locally significant vegetation were recorded within the Study Area, associated with unique landforms, or supporting Priority Flora (Table 4.1).

Table 4.1: Literature Review Significant Vegetation

| Pre-survey Likelihood | Report | Description | Significance | Distance from Survey Area |
|---|---|---|---|---|
| Medium | Flora and vegetation survey for Mungai Gold Operations Cutters Ridge Project (Phoenix Environmental Sciences, 2019) | Mid *Eucalyptus clelandiorum* woodland with other *Eucalyptus* trees, frequently *E. celastroides* subsp. *celastroides* or *E. griffithsii*, over isolated shrubs to mid open *Dodonaea lobulata*, *Eremophila scoparia* and *Exocarpos aphyllus* shrubland over isolated low to sparse *Olearia muelleri*, *Ptilotus obovatus* and *Westringia rigida* shrubland. | Landform locally significant, supports Priority listed flora. | ~20 km N |
| | | Tall *Acacia burkittii* shrubland over sparse to open mid *Dodonaea lobulata* shrubland over isolated low *Ptilotus obovatus* shrubs | Landform locally significant, supports Priority listed flora. | ~20 km N |
| | | Isolated mid *Cratystylis subspinescens*, *Pimelea microcephala* and *Senna artemisioides* subsp. *filifolia* shrubs over low *Atriplex vesicaria*, *Tecticornia* sp. (sterile 1) and *Roycea divaricata* shrubland over isolated low *Disphyma crassifolium*, *Brachyscome ciliaris* and *Vittadinia dissecta* var. *hirta* forbs. | Landform locally significant, supports Priority listed flora. | ~20 km N |
| | | Mid *Eucalyptus transcontinentalis* woodland with other *Eucalyptus* trees frequently *E. clelandiorum* and *E. salubris* over mid open *Atriplex nummularia*, *Eremophila scoparia* and *Senna artemisioides* subsp. *filifolia* shrubland over isolated low *Olearia muelleri*, *Eremophila parvifolia* subsp. *auricampa* and *Ptilotus obovatus* shrubs. | Landform locally significant, supports Priority listed flora. | ~20 km N |
| | | Isolated tall *Melaleuca halmaturorum* shrubs over low *Tecticornia indica* subsp. *bidens* chenopod shrubland over isolated low *Disphyma crassifolium* forbs. | Landform locally significant, supports Priority listed flora. | ~20 km N |

## 4.2. Vegetation Types

A total of 25 vegetation types (VTs), from 17 floristic groups were recorded for the combined project. The 17 floristic groups were split into 24 VTs when there was a structural difference in the vegetation noted either in sub-groups of the dendrogram (VT10-VT11, VT13-VT21), or structurally in the dominant species (VT04-VT05). One VT (VT02) was derived by combining two floristic groups due to the similar vegetation structure and location of the quadrats. One VT (VT25) was derived from structural analysis only as there was a low species diversity within this VT, and the quadrats were excluded from the floristic analysis. The dendrogram of floristic analysis is presented in Figure 4.1.

### 4.2.1. Vegetation Types – MinRes & M15/717

There were 16 VTs mapped at the Survey Area across a variety of habitats (Table 4.2; Map 4.1). The following dominant groups were recorded:

- Mixed *Eucalyptus* mid open woodlands on clay or sandy plains, floodplains, and minor drainage areas.
- Mixed *Eucalyptus* low open woodlands, over mixed *Acacia* and *Allocasuarina* shrublands gentle to moderately sloping basalt hills.
- *Acacia* and *Melaleuca* tall shrublands in the vicinity of outcropping granite.
- *Acacia* and *Allocasuarina* tall shrublands on sandy, lateritic yellow hill slopes.

The plains were primarily dominated by VT21, which was the most widespread VT at the Survey Area (mapped as 36.9% of the total Survey Area extent). This VT was found on sandy-clay plains and was characterised by *Eucalyptus celastroides*, *Eucalyptus transcontinentalis*, and *Eucalyptus salubris* mid woodland, over mix low shrubs. VT15 was the next most dominant (20.2%) and was characterised by *Eucalyptus salmonophloia* and *Eucalyptus lesouefii* mid open woodlands over mixed Chenopodiaceae spp. shrublands. Other less dominant plain VTs included: VT18 (8.1%), VT11 (2.2%), VT17 (1.9%), VT10 (1.5%), VT20 (1.2%), VT16 (1.2%), VT05 (1.2%), VT19 (0.8%). These were all dominated by mixed *Eucalyptus* spp., woodlands.

Gentle to moderately sloping basalt hills were common at the Survey Area and were dominated by VT13 (16.4%), characterised by *Eucalyptus lesouefii*, *Eucalyptus torquata*, and *Eucalyptus stricklandii* low open woodlands over mixed shrubs. VT14 was the next most dominant (0.7%), and included the areas surrounding Mt Marion, characterised by *Eucalyptus griffithsii*, *Eucalyptus torquata*, and *Eucalyptus oleosa* subsp. *oleosa* mid mallee woodlands over mixed shrubs. VT23, was the primary vegetation of Mt Marion, and was mapped as 0.2% of the Survey Area and was dominated by *Allocasuarina* and *Acacia* shrublands.

Granite slopes and outcrops were mapped as VT24 (4.8%) and was characterised by shrublands of *Acacia burkittii* and *Melaleuca hamata*.

Sandy yellow slopes were recorded in one small area of the south of the Survey Area within a section that extended into the Southern-Cross IBRA sub-region. This area was dominated by VT02 (2.2%) and VT01 (0.5%). Both VTs were dominated by mixed *Eucalyptus* mallee woodlands, over *Acacia resinimarginea* and/or *Allocasuarina acutivalvis* subsp. *acutivalvis* tall shrublands.

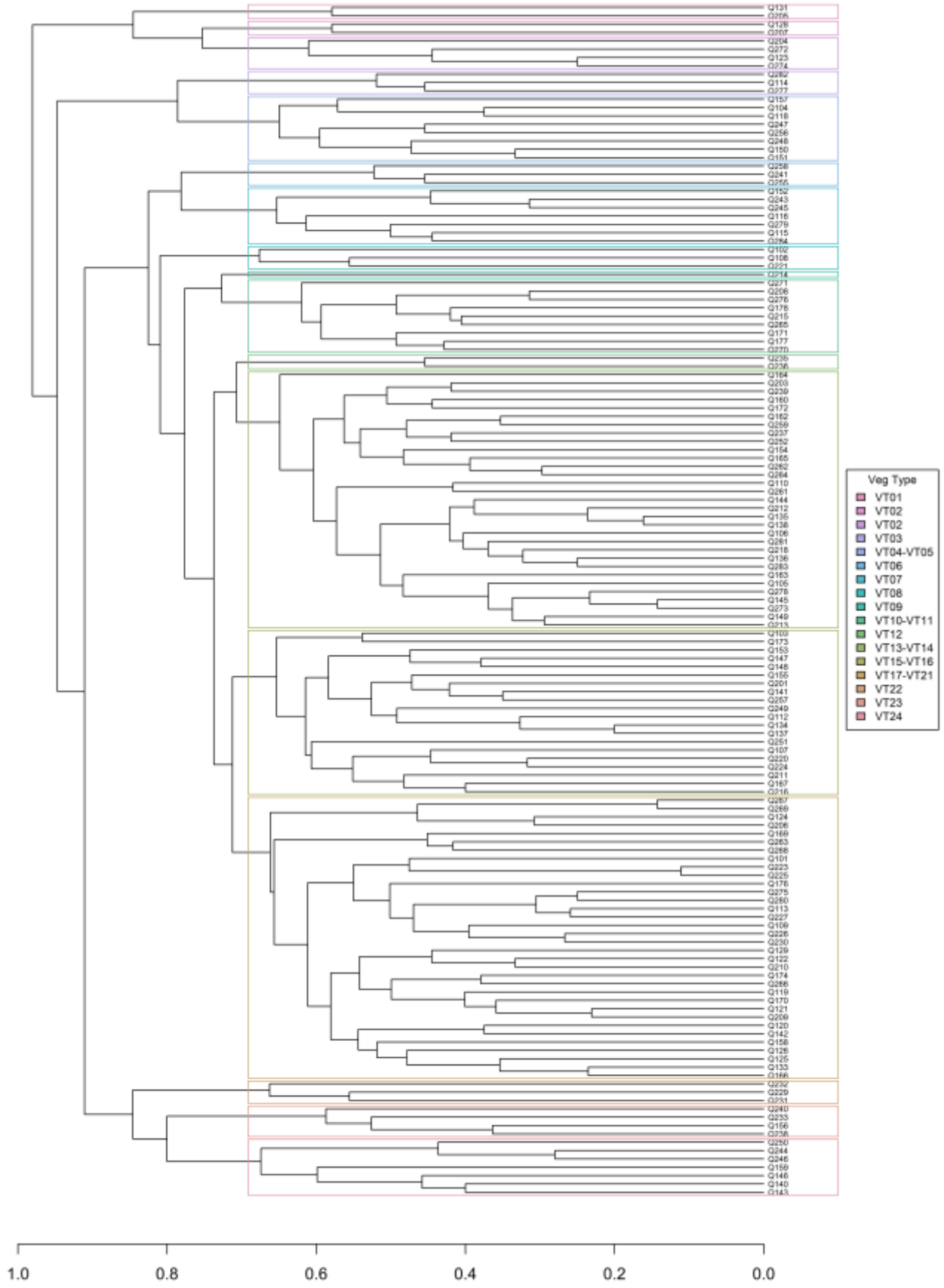



Figure 4.1: Dendrogram of Floristic Analysis

Table 4.2: Vegetation Types

| VT | Vegetation Description (NVIS) | Associated Species | Landform & Condition | Sites (Sites Outside)* | Area (%) & Total Mapped | Representative Photo |
|---|---|---|---|---|---|---|
| VT01 | *Eucalyptus platycorys* mid mallee woodland with *Allocasuarina acutivalvis* subsp. *acutivalvis*, *Allocasuarina campestris* tall open shrubland, over *Apectospermum subtenue, Dodonaea amblyophylla, Callitris preissii* mid open shrubland, over *Westringia cephalantha, Phebalium clavatum* low sparse shrubland | *Calytrix birdii, Cyathostemon verrucosus* (P3), *Eucalyptus rigidula, Lepidosperma sanguinolentum, Leucopogon* sp. Boorabbin (K.R. Newbey 8374), *Persoonia saundersiana, Phebalium clavatum* (P2), *Santalum acuminatum, Stenanthemum stipulosum, Thryptomene planiflora* (P1), *Verticordia chrysantha, Verticordia helmsii* | Slope simple, gentle. Yellow/cream sand.<br><br>Pristine. | Q131, Q205 | 36.2 ha (0.5%)<br><br>Total: 36.2 ha |  |
| VT02 | *+/-Eucalyptus leptopoda* subsp. *subluta* mid open mallee woodland with *Acacia resinimarginea*, *+/-Allocasuarina acutivalvis* subsp. *acutivalvis* tall shrubland, over *Thryptomene planiflora, Apectospermum subtenue*, *+/-Callitris preissii* mid open shrubland, over *Prostanthera grylloana*, *Leucopogon* sp. Coolgardie (M. Hislop & F. Hort MH 3197), *Phebalium filifolium* low isolated shrubs | *Acacia websteri* (P1), *Allocasuarina corniculata*, *Leucopogon* sp. Clyde Hill (M.A. Burgman 1207), *Micromyrtus erichsenii, Phebalium clavatum* (P2), *Thryptomene planiflora* (P1) | Slope simple, gentle. Yellow sand with common ironstone/laterite pebbles.<br><br>Pristine - Excellent: minor tracks. | Q123, Q204, Q207, Q272, Q274 (Q128)* | 167.1 ha (2.2%)<br><br>Total: 227.8 ha |  |

| VT | Vegetation Description (NVIS) | Associated Species | Landform & Condition | Sites (Sites Outside)* | Area (%) & Total Mapped | Representative Photo |
|---|---|---|---|---|---|---|
| VT05 | *Eucalyptus salmonophloia, Eucalyptus salubris* mid open woodland, over *Cratystylis subspinescens* mid sparse shrubland, over *Atriplex vesicaria, Maireana glomerifolia, Tecticornia disarticulata* low sparse shrubland | *Calandrinia lefroyensis* (P1), *Didymanthus roei, Eremophila scoparia, Frankenia interioris, Maireana appressa, Minuria cunninghamii, Rhagodia drummondii, Sarcozona praecox, Scaevola spinescens, Sclerolaena cuneata, Sclerolaena diacantha* | Clay pan. Orange/brown clay, with common quartz/ironstone pebbles.<br><br>Very Good-Excellent: medium grazing, tracks. | None inside Survey Area (Q247, Q253, Q256, R110, R112)* | 86.5 ha (1.2%)<br><br>Total: 1,777.3 ha |  |
| VT10 | *+/-Eucalyptus longissima, Eucalyptus yilgarnensis, Eucalyptus pileata* mid open mallee woodland with *Acacia burkittii, Acacia gibbosa* tall open shrubland, over *Senna artemisioides* subsp. *filifolia, Eremophila granitica* mid sparse shrubland, over *Grevillea acuaria, Acacia leptopetala, Scaevola spinescens* low sparse shrubland | *Alyxia buxifolia, Beyeria sulcata, Eremophila decipiens subsp. decipiens, Eremophila ionantha, Eremophila scoparia, Exocarpos aphyllus, Melaleuca acuminata, Olearia muelleri, Olearia pimeleoides, Ozothamnus cassiope, Prostanthera grylloana, Rhagodia drummondii* | Drainage depression area, and flat plains. Red-orange sandy clay.<br><br>Excellent-Pristine: low grazing. | Q130, Q178, Q208, Q265, Q271, Q276, R109 (Q215)* | 114 ha (1.5%)<br><br>Total: 138.3 ha |  |
| VT11 | *Acacia coolgardiensis, Acacia burkittii, Acacia websteri*, over *Leptospermopsis fastigiata, Melaleuca acuminata, Santalum acuminatum*, over *Prostanthera grylloana, Alyxia buxifolia, Olearia pimeleoides* low sparse shrubland with *Triodia scariosa* mid sparse hummock grassland | *Acacia leptopetala, Acacia websteri* (P1), *Dampiera tenuicaulis* var. *curvula, Eremophila decipiens* subsp. *decipiens, Ericomyrtus serpyllifolia, Exocarpos aphyllus, Goodenia havilandii, Grevillea acuaria, Ozothamnus cassiope, Scaevola spinescens, Schoenus subaphyllus, Thryptomene planiflora* (P1) | Plain, depression areas. Orange sand.<br><br>Pristine. | Q139, Q171, Q177, Q270, R119 | 166.1 ha (2.2%)<br><br>Total: 166.1 ha |  |

| VT | Vegetation Description (NVIS) | Associated Species | Landform & Condition | Sites (Sites Outside)* | Area (%) & Total Mapped | Representative Photo |
|---|---|---|---|---|---|---|
| VT13 | *Eucalyptus lesouefii, Eucalyptus torquata, +/-Eucalyptus stricklandii* low open woodland with *+/-Acacia burkittii* tall sparse shrubland, over *Alyxia buxifolia, Dodonaea lobulata, Eremophila oppositifolia* subsp. *angustifolia* mid sparse shrubland, over *Scaevola spinescens, Acacia erinacea, Westringia rigida* low sparse shrubland | *Eremophila acutifolia* (P3), *Eremophila clavata, Eremophila glabra* subsp. *glabra, Eremophila granitica, Eremophila oldfieldii* subsp. *angustifolia, Exocarpos aphyllus, Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2), *Olearia muelleri, Santalum spicatum, Senna artemisioides* subsp. *filifolia* | Slope simple, moderate. Red orange/brown sandy clay. Continuous basalt/chert/ironstone stones and pebbles.<br><br>Excellent- Pristine: minor tracks. | Q162, Q164, Q165, Q168, Q252, Q259, Q262, Q264, R120, R207, R209 (Q154, Q160, Q172, Q203, Q237, Q239)* | 1,234 ha (16.4%)<br><br>Total: 2,893.9 ha |  |
| VT14 | *Eucalyptus griffithsii, Eucalyptus torquata, +/-Eucalyptus oleosa* subsp. *oleosa* mid mallee woodland with *Eremophila interstans* subsp. *interstans, +/-Acacia burkittii, Casuarina pauper* tall sparse shrubland, over *Senna artemisioides* subsp. *filifolia, Dodonaea lobulata, Eremophila oldfieldii* subsp. *angustifolia* mid sparse shrubland, over Scaevola spinescens, *Eremophila glabra* subsp. *glabra, Olearia muelleri* low sparse shrubland | *Acacia erinacea, Acacia leptopetala, Acacia tetragonophylla, Alyxia buxifolia, Atriplex vesicaria, Exocarpos aphyllus, Maireana georgei, Ptilotus obovatus, Santalum spicatum, Senna artemisioides* subsp. x *artemisioides, Westringia rigida* | Slope simple, moderate to steep. Red-orange sandy-clay. Continuous basalt stones.<br><br>Excellent- Pristine: minor tracks. | Q163, Q261 (Q105, Q106, Q110, Q111, Q135, Q136, Q138, Q144, Q145, Q149, Q212, Q213, Q218, Q273, Q278, Q281, Q283, R105, R107, R210)* | 48.8 ha (0.7%)<br><br>Total: 2,870.2 ha |  |
| VT15 | *Eucalyptus salmonophloia, Eucalyptus lesouefii* mid open woodland with *Eremophila dempsteri, Exocarpos aphyllus* tall sparse shrubland, over *Senna artemisioides* subsp. *filifolia, Atriplex nummularia* subsp. *spathulata, Eremophila scoparia* mid sparse shrubland, over *Atriplex vesicaria, Cratystylis conocephala, Rhagodia drummondii* low sparse shrubland | *Acacia leptopetala, Austrostipa elegantissima, Maireana georgei, Maireana triptera, Olearia muelleri, Pittosporum angustifolium, Ptilotus obovatus, Ptilotus procumbens* (P1), *Scaevola spinescens, Sclerolaena diacantha, Senna artemisioides* subsp. x *artemisioides, Solanum nummularium* | Plains and floodplains. Red orange/brown sandy clay. Common ironstone and quartz pebbles.<br><br>Very Good-Pristine: minor tracks, low grazing, clearing. | Q173, Q249, Q254, R206, R213 (Q103, Q112, Q132, Q134, Q137, Q141, Q147, Q148, Q153, Q155, Q201, Q257, Q260)* | 1,513.2 ha (20.2%)<br><br>Total: 7,567.4 ha |  |

| VT | Vegetation Description (NVIS) | Associated Species | Landform & Condition | Sites (Sites Outside)* | Area (%) & Total Mapped | Representative Photo |
|---|---|---|---|---|---|---|
| VT16 | *+/-Eucalyptus griffithsii, Eucalyptus salmonophloia* mid open woodland with *Eremophila interstans* subsp. *virgata, Exocarpos aphyllus* tall sparse shrubland, over *Senna artemisioides* subsp. *filifolia, Eremophila ionantha, Acacia leptopetala* mid sparse shrubland, over *Lycium australe, Atriplex vesicaria, Rhagodia drummondii* low sparse shrubland | *Atriplex nummularia* subsp. *spathulata, Enchylaena tomentosa* var. *tomentosa, Eremophila decipiens* subsp. *decipiens, Leichhardtia australis, Ptilotus holosericeus, Ptilotus obovatus, Scaevola spinescens, Sclerolaena diacantha, Sclerolaena obliquicuspis* | Drainage lines and floodplains on flats. Red-orange, sandy clay/clay.<br><br>Excellent: moderate grazing. | Q167, Q251 (Q107, Q211, Q216, Q220, Q224, R108)* | 88.7 ha (1.2%)<br><br>Total: 705.3 ha |  |
| VT17 | *Eucalyptus ravida, +/-Eucalyptus yilgarnensis* low woodland with *Eremophila dempsteri, +/-Melaleuca lanceolata*, Acacia *enervia* subsp. *enervia* tall sparse shrubland, over *Senna artemisioides* subsp. *filifolia, Exocarpos aphyllus, Eremophila ionantha* mid sparse shrubland, over *Scaevola spinescens, Eremophila clavata, Acacia resinistipulea* low sparse shrubland | *Acacia burkittii, Alyxia buxifolia, Dodonaea lobulata, Eremophila acutifolia* (P3), *Eucalyptus celastroides, Eucalyptus oleosa* subsp. *oleosa, Eucalyptus salmonophloia, Grevillea acuaria, Melaleuca acuminata, Olearia muelleri* | Flat plains. Red-orange, sandy-clay.<br><br>Pristine. | Q124, Q206, Q267, Q269 | 141 ha (1.9%)<br><br>Total: 141 ha |  |
| VT18 | *Eucalyptus lesouefii* mid woodland with *Melaleuca sheathiana* tall open shrubland, over *Eremophila scoparia, Exocarpos aphyllus, Senna artemisioides* subsp. *filifolia* mid sparse shrubland, over *Olearia muelleri, Acacia erinacea* low sparse shrubland | *Acacia burkittii, Atriplex nummularia* subsp. *spathulata, Eremophila clavata, Eremophila interstans* subsp. *interstans, Eucalyptus torquata, Maireana pentatropis, Sclerolaena diacantha, Senna artemisioides* subsp. x *artemisioides* | Plains and low rises. Red orange/brown sandy/clay, clay. Common ironstone pebbles.<br><br>Very Good-Pristine: clearing and tracks. | Q169, Q263, Q268, R122, R208 | 611.3 ha (8.1%)<br><br>Total: 618.1 ha |  |

| VT | Vegetation Description (NVIS) | Associated Species | Landform & Condition | Sites (Sites Outside)* | Area (%) & Total Mapped | Representative Photo |
|---|---|---|---|---|---|---|
| VT19 | *Eucalyptus salubris, Eucalyptus clelandiorum*, +/-*Eucalyptus salmonophloia* low woodland, over *Senna artemisioides* subsp. *filifolia*, *Eremophila scoparia*, *Exocarpos aphyllus* mid sparse shrubland, over *Eremophila caperata, Eremophila parvifolia* subsp. *auricampi, Olearia muelleri* low sparse shrubland | *Alyxia buxifolia, Eremophila acutifolia* (P3), *Eremophila dempsteri, Eremophila rugosa, Eucalyptus celastroides, Eucalyptus ravida, Maireana georgei, Maireana radiata, Notisia intonsa* (P3), *Santalum acuminatum, Scaevola spinescens, Sclerolaena diacantha, Sclerolaena obliquicuspis* | Flat plains. Red-orange, sandy-clay. Continuous ironstone pebbles.<br><br>Excellent: low grazing, tracks. | Q161 (Q101, Q127, Q202, Q223, Q225, Q242)* | 63.4 ha (0.8%)<br><br>Total: 916.3 ha |  |
| VT20 | *Eucalyptus cylindrocarpa, Eucalyptus yilgarnensis* mid open mallee woodland with +/-*Melaleuca sheathiana* tall sparse shrubland, over *Senna artemisioides* subsp. *filifolia, Eremophila scoparia, Acacia leptopetala* mid sparse shrubland, over *Olearia muelleri, Westringia rigida* low sparse shrubland with *Triodia scariosa* low sparse hummock grassland | *Acacia nyssophylla, Austrostipa elegantissima, Dianella revoluta* var. *divaricata, Eremophila caperata, Eremophila ionantha, Eremophila parvifolia* subsp. *auricampi, Eucalyptus oleosa* subsp. *oleosa, Exocarpos aphyllus, Grevillea huegelii, Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2), *Scaevola spinescens* | Flat plains. Orange sand.<br><br>Excellent-Pristine: low tracks and low grazing. | Q176, R121 (Q109, Q113, Q222, Q226, Q227, Q228, Q230, Q234, Q275, Q280, R114, R211)* | 91.1 ha (1.2%)<br><br>Total: 2,688.9 ha |  |
| VT21 | *Eucalyptus celastroides, Eucalyptus transcontinentalis, Eucalyptus salubris* mid woodland, over *Eremophila scoparia, Senna artemisioides* subsp. *filifolia*, *Eremophila ionantha* mid sparse shrubland, over *Olearia muelleri, Acacia leptopetala, Eremophila clavata* low sparse shrubland | *Acacia merrallii, Alyxia buxifolia, Austrostipa elegantissima, Cratystylis conocephala, Daviesia aphylla, Eremophila acutifolia* (P3), *Eremophila caperata, Eucalyptus urna* subsp. *xesta* (P3), *Exocarpos aphyllus, Maireana georgei, Maireana trichoptera, Santalum acuminatum, Scaevola spinescens, Sclerolaena diacantha, Senna artemisioides* subsp. x *artemisioides* | Flat plains. Red-orange, sand/sandy-clay. Common ironstone/quartz pebbles.<br><br>Excellent-Pristine: clearing, tracks. | Q119, Q120, Q121, Q122, Q142, Q158, Q166, Q170, Q174, Q175, Q209, Q210, Q266, R214 (Q125, Q126, Q133)* | 2,771.8 ha (36.9%)<br><br>Total: 4,071.9 ha |  |

| VT | Vegetation Description (NVIS) | Associated Species | Landform & Condition | Sites (Sites Outside)* | Area (%) & Total Mapped | Representative Photo |
|---|---|---|---|---|---|---|
| VT23 | *Allocasuarina campestris*, *Acacia collegialis*, *Acacia burkittii* tall open shrubland, over *Santalum spicatum* mid isolated shrubs, over *Prostanthera incurvata*, *Eremophila granitica*, *Pimelea microcephala* subsp. *microcephala* low sparse shrubland | *Brachychiton gregorii*, *Cheilanthes sieberi* subsp. *sieberi*, *Chrysocephalum puteale*, *Dampiera latealata*, *Eucalyptus websteriana* subsp. *norsemanica* (P1), *Eucalyptus websteriana* subsp. *websteriana*, *Euphorbia tannensis* subsp. *eremophila*, *Leichhardtia australis*, *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2), *Ptilotus obovatus*, *Scaevola spinescens*, *Thysanotus manglesianus* | Slopes simple, moderate. Red-orange sandy-clay. Continuous basalt stones and boulders.<br><br>Pristine. | None inside Survey Area (Q156, Q233, Q238, Q240)* | 11.5 ha (0.2%)<br><br>Total: 227.4 ha |  |
| VT24 | *Acacia burkittii*, *Melaleuca hamata*, +/- *Brachychiton gregorii* tall shrubland, over *Eremophila granitica*, *Mirbelia depressa*, *Prostanthera grylloana* low sparse shrubland | *Acacia websteri* (P1), *Alyxia buxifolia*, *Cheilanthes sieberi* subsp. *sieberi*, *Leichhardtia australis*, *Lepidium genistoides* (P3), *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2), *Olearia pimeleoides*, **Oligocarpus calendulaceus*, *Senna artemisioides* subsp. x *artemisioides*, *Thryptomene australis* subsp. *brachyandra*, *Thryptomene planiflora* (P1), *Thysanotus manglesianus*, *Vincetoxicum lineare* | Slopes simple, gentle. Red orange/cream clay loam. Continuous granite stones and boulders.<br><br>Excellent-Pristine: low grazing, low weeds. | Q140, Q159 (Q143, Q146, Q244, Q246, Q250, R205)* | 357.4 ha (4.8%)<br><br>Total: 1,990.8 ha |  |


## Legend

- M15/717 Survey Area
- MinRes Survey Area

**Phase 1 Sample Sites**

- Quadrat
- Releve

**Phase 2 Sample Sites**

- Quadrat
- Releve

**Vegetation Type**

- VT01
- VT02
- VT05
- VT10
- VT11
- VT13
- VT14
- VT15
- VT16
- VT17
- VT18
- VT19
- VT20
- VT21
- VT23
- VT24
- Completely Degraded

N

0 1 2 3 4 km

Scale 1:110,000 @ A4

Coordinate System: GDA 2020 MGA Zone 51
Projection: Universal Transverse Mercator
Units: Metre

Spectrum ECOLOGY • SPATIAL

Author: ZG

Date: 20-09-2024

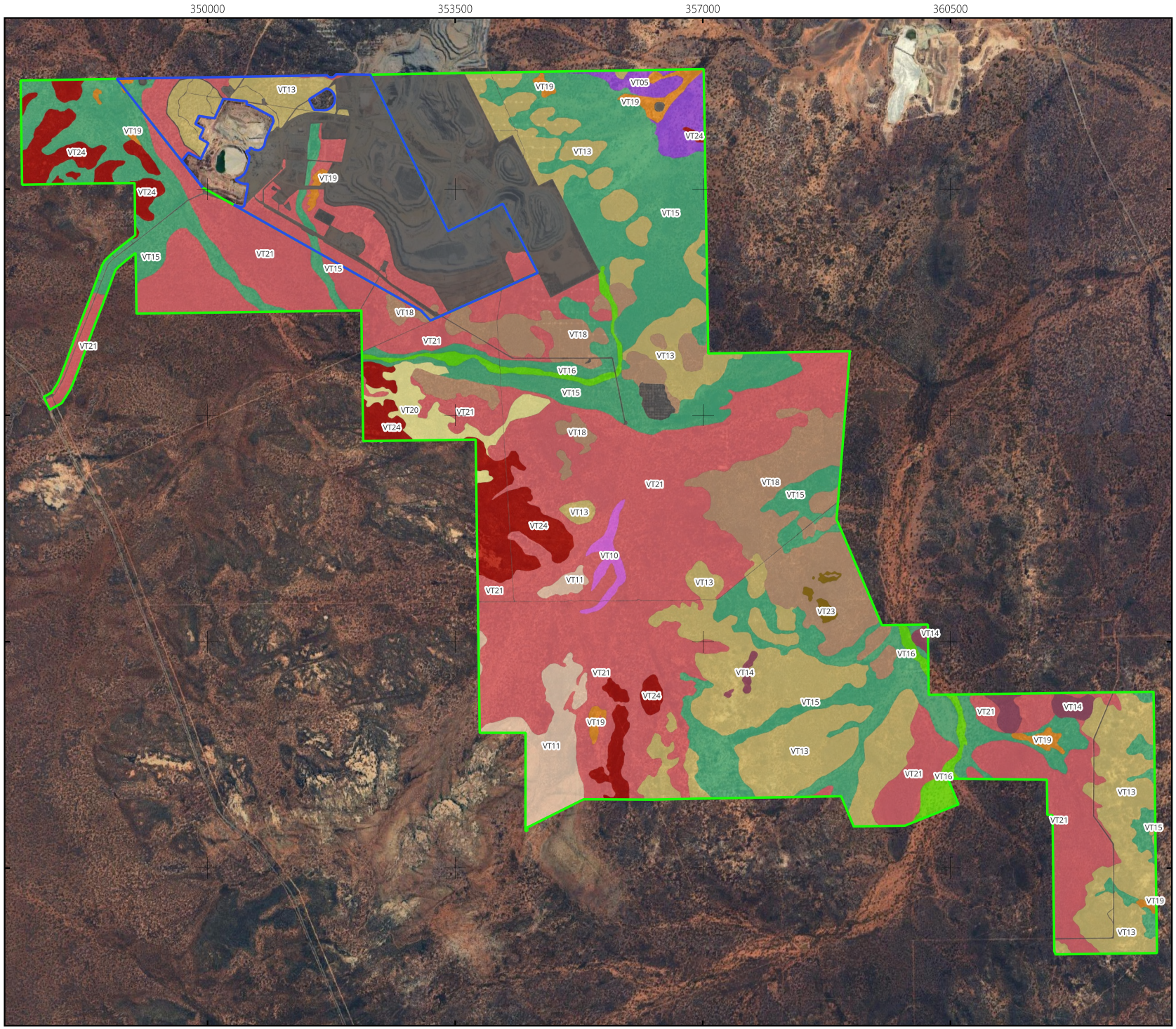
# Vegetation Types

Mt Marion - MinRes & M15/717 Tenements - Detailed Flora & Vegetation Assessment

MAP

Prepared for
Mineral Resources Limited

4.1




## Legend

- M15/717 Survey Area
- MinRes Survey Area

**Vegetation Type**

- VT05
- VT10
- VT11
- VT13
- VT14
- VT15
- VT16
- VT18
- VT19
- VT20
- VT21
- VT23
- VT24
- Completely Degraded

N

0 1 2 3 km

Scale 1:75,000 @ A4

Coordinate System: GDA 2020 MGA Zone 51
Projection: Universal Transverse Mercator
Units: Metre

Spectrum ECOLOGY • SPATIAL

Author: ZG

Date: 20-09-2024

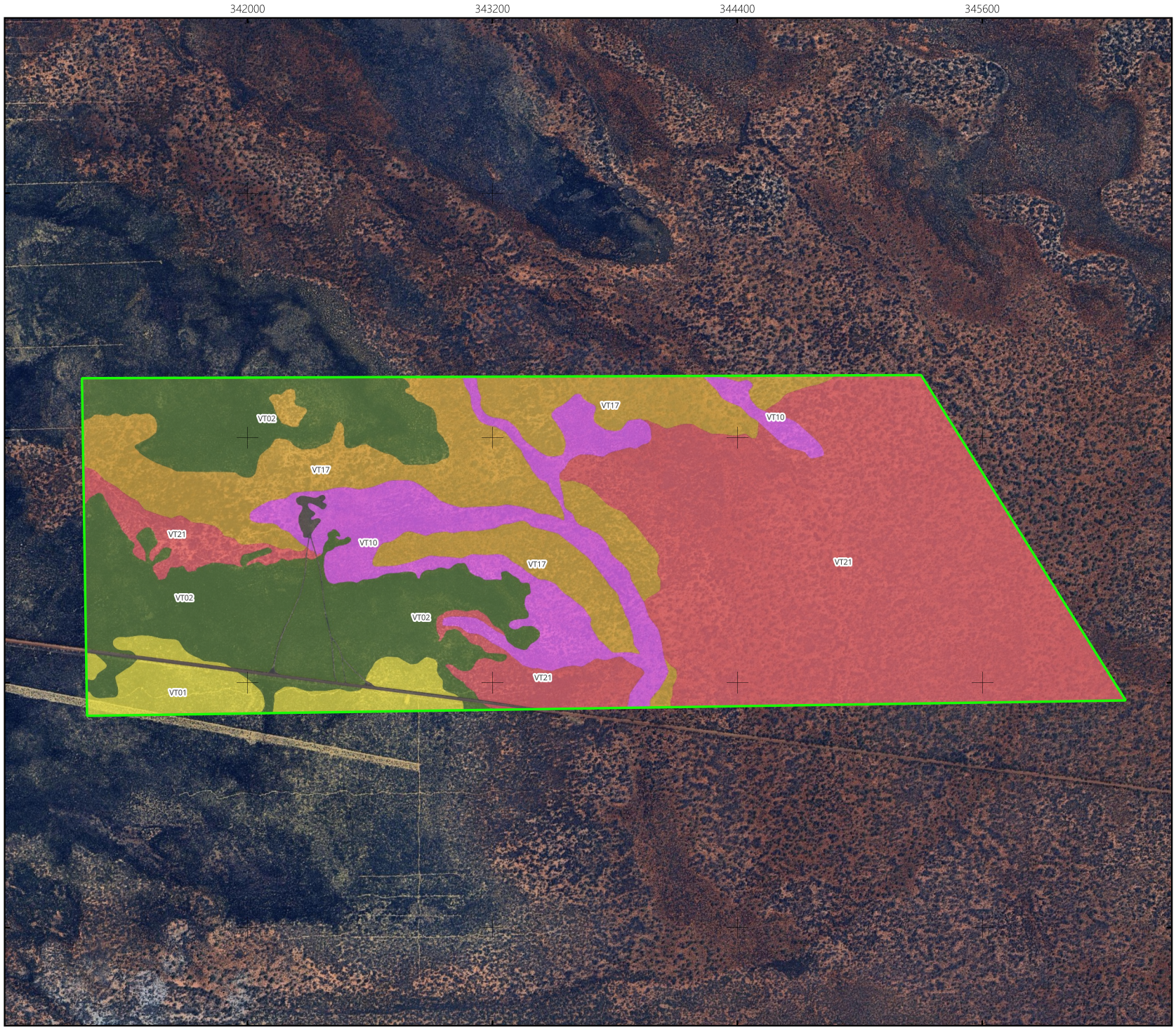
# Vegetation Types - East

Mt Marion - MinRes & M15/717 Tenements - Detailed Flora & Vegetation Assessment

MAP

Prepared for
Mineral Resources Limited

4.2




## Legend

- M15/717 Survey Area
- MinRes Survey Area

**Vegetation Type**

- VT01
- VT02
- VT10
- VT17
- VT21
- Completely Degraded

N

0 0.5 1 km

Scale 1:26,000 @ A4

Coordinate System: GDA 2020 MGA Zone 51
Projection: Universal Transverse Mercator
Units: Metre

Spectrum ECOLOGY • SPATIAL

Author: ZG

Date: 20-09-2024

# Vegetation Types - Southwest

Mt Marion - MinRes & M15/717 Tenements - Detailed Flora & Vegetation Assessment

MAP

Prepared for
Mineral Resources Limited

4.3

## 4.3. Significant Vegetation

No VTs recorded within the Survey Area resemble any known TEC or PEC communities. Based on the definitions of significant vegetation listed in section 2.4.4 (Environmental Protection Authority, 2016a), the VTs that may be considered significant at the Survey Area are discussed in Table 4.3, with the following identified as significant:

- VT01 provides a role of refuge for the regionally significant Priority Flora taxon *Phebalium clavatum* (P2). VT01 also provides a role of refuge for another two Priority Flora taxa, *Cyathostemon verrucosus* (P3), and *Thryptomene planiflora* (P1).
- VT02 provides a role of refuge for the regionally significant Priority Flora taxon *Phebalium clavatum* (P2). VT02 also provides a role of refuge for another two Priority Flora taxa, *Acacia websteri* (P1), and *Thryptomene planiflora* (P1).
- VT13 provides a role as refuge for the locally and regionally significant *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2) as well as another priority species, *Eremophila acutifolia* (P3).
- VT20 provides a role of refuge for the locally and regionally significant Priority Flora taxon *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2).
- VT23 provides refuge to the locally significant Priority Flora taxon, *Eucalyptus websteriana* subsp. *norsemanica* (P1) and the locally and regionally significant taxon, *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2).
- VT24 provides refuge to the locally significant Priority Flora taxon, *Lepidium genistoides* (P3) and the locally and regionally significant taxon, *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2).

Table 4.3: Potential Significant Vegetation Discussion

| Significance | VT | Details |
|---|---|---|
| Identified as TEC | - | - |
| Identified as PEC | - | - |
| Restricted distribution^<br><br>^for the purpose of this assessment, there was a discussion for VTs with less than a 300 ha (<1%) mapped extent within the combined Survey Area's (Spectrum Ecology & Spatial, 2024). | VT01 | VT01 had a restricted extent at the Survey Area (36.2 ha). However, the landform this VT occurs on (gentle slopes with yellow/cream sand) appears widespread in the local area and therefore VT01 is not considered significant due to restricted distribution. |
| | VT02 | VT02 had a restricted extent at the Survey Area (227.8 ha). However, the landform this VT occurs on (gentle slopes with yellow sand and common ironstone/laterite gravel) appears widespread in the local area and therefore VT02 is not considered significant due to restricted distribution. |
| | VT10 | VT10 had a restricted extent at the Survey Area (138.3 ha). The VT was found on a drainage line which are mapped as small extents within the Survey Area which is common due to the small size of the landforms they occur on; drainage line landforms are widespread throughout the local area and region and are therefore not considered significant VTs. |
| | VT11 | VT11 had a restricted extent in the Survey Area (166.1 ha). The VT (plain/depression on orange sand) appears to be widespread in the local area and is not considered significant. |
| | VT17 | VT17 had a restricted extent in the Survey Area (141.0 ha). However, landforms that the VT occurs on (flat plains of red-orange sandy clay) appear widespread in the local area and therefore VT17 is not considered significant. |
| | VT23 | VT23 had a restricted extent in the combined Survey Area (227.4 ha). VT23 is found on moderate slope landforms containing continuous basalt stones and |

| Significance | VT | Details |
|---|---|---|
| | | boulders, which appear to be widespread in the local area and therefore VT23 is not considered significant due to restricted distribution. |
| Degree of historical impact from threatening processes | - | - |
| A role as a refuge^<br><br>^for the purpose of this report, Priority species recorded within the Hamptons Tenement Survey Area (Spectrum Ecology & Spatial, 2024), were included in this discussion. | VT01 | VT01 provides a role of refuge for the Priority taxa *Cyathostemon verrucosus* (P3), *Phebalium clavatum* (P2), and *Thryptomene planiflora* (P1). Of which *Phebalium clavatum* (P2) is considered regionally significant and thus VT01 should be considered a significant VT. |
| | VT02 | VT02 provides a role of refuge for the Priority taxa *Acacia websteri* (P1), *Phebalium clavatum* (P2), and *Thryptomene planiflora* (P1). Of which *Phebalium clavatum* (P2) is considered regionally significant and thus VT01 should be considered a significant VT. |
| | VT05 | VT05 provides a role as refuge for the Priority Flora taxon *Calandrinia lefroyensis* (P1). However, this is not considered a locally or regionally significant taxon, therefore VT05 is not considered significant. |
| | VT11 | VT11 provides a role as refuge for the Priority taxa *Acacia websteri* (P1), and *Thryptomene planiflora* (P1). Neither are considered locally or regionally significant Priority Flora and therefore VT11 is not considered significant. |
| | VT13 | VT13 provides a role as refuge for *Eremophila acutifolia* (P3) and the locally and regionally significant *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2). Therefore, VT13 should be considered significant. |
| | VT17 | VT17 provides a role as refuge for the Priority taxon *Eremophila acutifolia* (P3). However, the species is not considered a locally or regionally significant taxon, therefore the VT is not considered significant. |
| | VT19 | VT19 provides a role as refuge for the Priority taxa *Eremophila acutifolia* (P3) and *Notisia intonsa* (P3). However, neither are considered a locally or regionally significant taxon, therefore the VT is not considered significant. |
| | VT20 | VT20 provides a role of refuge for the locally and regionally significant Priority Flora taxon *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2). As such the VT should be considered significant. |
| | VT21 | VT21 provides a role as refuge for the Priority taxa *Eremophila acutifolia* (P3) and *Eucalyptus urna* subsp. *xesta* (P3). However, neither are considered a locally or regionally significant taxon, therefore the VT is not considered significant. |
| | VT23 | VT23 provides refuge to the locally significant Priority Flora taxon, *Eucalyptus websteriana* subsp. *norsemanica* (P1) and the locally and regionally significant taxon, *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2). As such the VT should be considered significant. |
| | VT24 | VT24 provides a role of refuge for the locally and regionally significant Priority Flora taxon *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2) and the locally significant Priority Flora taxon *Lepidium genistoides* (P3). The VT also provides a role of refuge to the Priority taxa, *Acacia websteri* (P1) and *Thryptomene planiflora* (P1). As such the VT should be considered significant. |
| Providing an important function required to maintain ecological integrity of a significant ecosystem | - | - |
| Groundwater Dependent Ecosystems | - | No GDE's identified in Survey Area. |
| Other – vegetation at risk from mining activities | - | - |

### 4.3.1. Post-Survey Review of Desktop Assessment Vegetation

Four of the five significant vegetation from the literature review assigned 'Medium' likelihood of occurrence during the desktop assessment, were given a 'High' likelihood of occurrence post-survey, as the survey effort recorded similar VTs to those identified in the desktop assessment that supported Priority listed flora. The remaining identified significant vegetation was reduced to 'Low' as no similar VT was recorded in the survey. Details of the post-survey review of the literature review significant vegetation are provided in Table 4.4.

Table 4.4: Post-survey Likelihood of Literature Review Significant Vegetation

| Pre-survey Likelihood | Post-survey Likelihood | Report | Description | Significance | Distance from Survey Area | Details |
|---|---|---|---|---|---|---|
| Medium | High | Flora and vegetation survey for Mungai Gold Operations Cutters Ridge Project (Phoenix Environmental Sciences, 2019) | Mid *Eucalyptus clelandiorum* woodland with other *Eucalyptus* trees, frequently *E. celastroides* subsp. *celastroides* or *E. griffithsii*, over isolated shrubs to mid open *Dodonaea lobulata*, *Eremophila scoparia* and *Exocarpos aphyllus* shrubland over isolated low to sparse *Olearia muelleri*, *Ptilotus obovatus* and *Westringia rigida* shrubland. | Landform locally significant, supports Priority listed flora. | ~20 km N | Similar VT identified in Survey Area (VT19) that also provided a role of refuge to the Priority Flora *Eremophila acutifolia* (P3) and *Notisia intonsa* (P3). |
| | | | Tall *Acacia burkittii* shrubland over sparse to open mid *Dodonaea lobulata* shrubland over isolated low *Ptilotus obovatus* shrubs | Landform locally significant, supports Priority listed flora. | ~20 km N | Similar VT identified in Survey Area (VT24) that also provided a role of refuge to the Priority Flora *Lepidium genistoides* (P3) and *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2). |
| | | | Isolated mid *Cratystylis subspinescens*, *Pimelea microcephala* and *Senna artemisioides* subsp. *filifolia* shrubs over low *Atriplex vesicaria*, *Tecticornia* sp. (sterile 1) and *Roycea divaricata* shrubland over isolated low *Disphyma crassifolium*, *Brachyscome ciliaris* and *Vittadinia dissecta* var. *hirta* forbs. | Landform locally significant, supports Priority listed flora. | ~20 km N | Similar VT identified in Survey Area (VT05) that also provided a role of refuge to the Priority Flora *Calandrinia lefroyensis* (P1). |
| | | | Mid *Eucalyptus transcontinentalis* woodland with other *Eucalyptus* trees frequently *E. clelandiorum* and *E. salubris* over mid open *Atriplex nummularia*, *Eremophila scoparia* and *Senna artemisioides* subsp. *filifolia* shrubland over isolated low *Olearia muelleri*, *Eremophila parvifolia* subsp. *auricampa* and *Ptilotus obovatus* shrubs. | Landform locally significant, supports Priority listed flora. | ~20 km N | Similar VT identified in Survey Area (VT19 and VT21) that also provided a role of refuge to the Priority Flora *Eremophila acutifolia* (P3) and *Notisia intonsa* (P3). |
| | Low | | Isolated tall *Melaleuca halmaturorum* shrubs over low *Tecticornia indica* subsp. *bidens* chenopod shrubland over isolated low *Disphyma crassifolium* forbs. | Landform locally significant, supports Priority listed flora. | ~20 km N | Similar VT not identified in Survey Area |

### 4.3.2. Local & Regional Context of Vegetation Types

The vegetation types have been further considered at a local and regional context in Table 4.5. Local significance was determined if the vegetation types were locally restricted (by using vegetation mapping and/or landforms in the local vicinity), and/or were associated with locally significant flora taxa. Regional significance was determined if the vegetation types were regionally restricted (by using BVAs and/or land system mapping to determine a potential regional extent), and/or were associated with regionally significant flora taxa. Vegetation types were matched using the approximate spatial extent of the land systems and BVAs, and/or the species present. As the BVAs and land system mapping were undertaken at a broad scale, some vegetation types may not be matched, or some species may be outdated and/or generalised.

Table 4.5: Local & Regional Context & Discussion of Vegetation Types

| Vegetation Type | Associated BVA | Associated Land System | Local Context & Discussion | Regional Context & Discussion |
|---|---|---|---|---|
| **VT01:** *Eucalyptus platycorys* mid mallee woodland with *Allocasuarina acutivalvis* subsp. *acutivalvis*, *Allocasuarina campestris* tall open shrubland, over *Apectospermum subtenue*, *Dodonaea amblyophylla*, *Callitris preissii* mid open shrubland, over *Westringia cephalantha*, *Phebalium clavatum* (P2) low sparse shrubland | **1413:** *Acacia* spp., *Allocasuarina campestris*, and *Melaleuca uncinata* tall shrubland. | **AC1:** Gently sloping to gently undulating plateau areas, or uplands, on granites, gneisses, and allied rocks, with long gentle slopes and, in places, abrupt erosional scarps. | VT01 was the least common VT in the combined Survey Area; The yellow sandy gently sloping plain landforms it occurs on are restricted throughout the Survey Area but not the local vicinity. The VT is not locally significant. | Associated with a widespread BVA; 1413 and widespread AC1 land system. The VT however provides a role of refuge for the regionally significant *Phebalium clavatum* (P2) and is therefore considered regionally significant. |
| **VT02:** *+/-Eucalyptus leptopoda* subsp. *subluta* mid open mallee woodland with *Acacia resinimarginea*, *+/-Allocasuarina acutivalvis* subsp. *acutivalvis* tall shrubland, over *Thryptomene planiflora*, *Apectospermum subtenue*, *+/-Callitris preissii* mid open shrubland, over *Prostanthera grylloana*, *Leucopogon* sp. Coolgardie (M. Hislop & F. Hort MH 3197), *Phebalium filifolium* low isolated shrubs | | | VT02 has a restricted extent in the combined Survey Area; the gentle slopes with yellow sand and common ironstone/laterite gravel landforms it occurs on are restricted throughout the Survey Area but not the local vicinity. The VT is not locally significant. | Associated with a widespread BVA; 1413 and widespread AC1 land system. The VT however provides a role of refuge for the regionally significant *Phebalium clavatum* (P2) and is therefore considered regionally significant. |
| **VT05:** *Eucalyptus salmonophloia*, *Eucalyptus salubris* mid open woodland, over *Cratystylis subspinescens* mid sparse shrubland, over *Atriplex vesicaria*, *Maireana glomerifolia*, *Tecticornia disarticulata* low sparse chenopod shrubland | **936:** *Eucalyptus salmonophloia*, *Eucalyptus lesouefii*, and *Eucalyptus transcontinentalis* mid woodland, over *Atriplex* spp. open chenopod shrubland. | **My154:** Undulating country on acid volcanic rocks and sedimentary materials. | VT05 was a common VT in the combined Survey Areas; the clay-pan with quartz/ ironstone pebble landform it occurs on is widespread in the Survey Area and the local vicinity. The VT is not locally significant. | Associated with a well-represented BVA (936) and land system (My154) within the Coolgardie IBRA Bioregion. The VT is not regionally significant. |
| **VT10:** *+/-Eucalyptus longissima*, *Eucalyptus yilgarnensis*, *Eucalyptus pileata* mid open mallee woodland with *Acacia burkittii*, *Acacia gibbosa* tall open shrubland, over *Senna artemisioides* subsp. *filifolia*, *Eremophila granitica* mid sparse shrubland, over *Grevillea acuaria*, *Acacia leptopetala*, *Scaevola spinescens* low sparse shrubland | No associated BVA for this VT. | **AC1:** Gently sloping to gently undulating plateau areas, or uplands, on granites, gneisses, and allied rocks, with long gentle slopes and, in places, abrupt erosional scarps.<br>**Mx42:** Broad flat to undulating valleys with isolated granitic rock outcrops and some low escarpments; some seasonal lakes and clay pans. | VT10 had a limited extent within the Survey Area. However, the drainage/depression landforms on which it occurs are often mapped at a low extent due to their small size. Drainage areas are widespread in the local area and as such the VT is not considered locally significant. | Associated with two well-represented land systems within the Coolgardie IBRA Bioregion; AC1 and Mx42. The VT is not regionally significant. |

| Vegetation Type | Associated BVA | Associated Land System | Local Context & Discussion | Regional Context & Discussion |
|---|---|---|---|---|
| **VT11:** *Acacia coolgardiensis, Acacia burkittii, Acacia websteri*, over *Leptospermopsis fastigiata, Melaleuca acuminata, Santalum acuminatum*, over *Prostanthera grylloana, Alyxia buxifolia, Olearia pimeleoides* low sparse shrubland with *Triodia scariosa* mid sparse hummock grassland | No associated BVA for this VT. | **Mx41:** Flat to undulating pediments marginal to unit AC1; granitic rock outcrop; some low escarpments. | VT11 had a limited extent within the Survey Area. However, the plains/depressions of orange sand landforms of which it occurs are widespread in the local area. The VT provides a role of refuge for two Priority Flora; *Acacia websteri* (P1) and *Thryptomene planiflora* (P1), neither of which are considered locally significant. The VT is not considered locally significant. | Associated with a well-represented land system within the Coolgardie IBRA Bioregion; Mx41. The VT provides a role of refuge for two Priority Flora; *Acacia websteri* (P1) and *Thryptomene planiflora* (P1), neither of which are considered regionally significant. The VT is not regionally significant. |
| **VT13:** *Eucalyptus lesouefii, Eucalyptus torquata*, +/- *Eucalyptus stricklandii* low open woodland with +/- *Acacia burkittii* tall sparse shrubland, over *Alyxia buxifolia, Dodonaea lobulata, Eremophila oppositifolia* subsp. *angustifolia* mid sparse shrubland, over *Scaevola spinescens, Acacia erinacea, Westringia rigida* low sparse shrubland | **9:** *Eucalyptus torquata, Eucalyptus lesouefii*, and *Eucalyptus clelandii* low woodland, over *Eremophila scoparia, Eremophila glabra*, and *Eremophila oldfieldii* tall sparse shrubland. | Associated with multiple land systems in the area; **BB5**, **Moriarty System**, **Mx43**, and **My54**. | VT13 had a large extent within the combined Survey Areas. However, the VT provides a role of refuge for the locally significant Priority Flora taxon *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2), as well as another Priority Flora, *Eremophila acutifolia* (P3). Therefore, the VT is considered locally significant. | Associated with the widespread BVA 9 and multiple well-represented land systems (BB5, Moriarty System, Mx43, and My54). However, the VT provides a role of refuge for the regionally significant Priority Flora taxon *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2). Therefore, the VT is considered regionally significant. |
| **VT14:** *Eucalyptus griffithsii, Eucalyptus torquata*, +/- *Eucalyptus oleosa* subsp. *oleosa* mid mallee woodland with *Eremophila interstans* subsp. *interstans*, +/-*Acacia burkittii, Casuarina pauper* tall sparse shrubland, over *Senna artemisioides* subsp. *filifolia, Dodonaea lobulata, Eremophila oldfieldii* subsp. *angustifolia* mid sparse shrubland, over Scaevola spinescens, *Eremophila glabra* subsp. *glabra*, *Olearia muelleri* low sparse shrubland | | Associated with multiple land systems in the area; **BB5**, **Moriarty System**, and **Gumland System**. | VT14 had a limited extent in the Survey Area but was widespread in the combined Survey Areas. The moderate to steep slopes with continuous basalt stone landform it occurs on is widespread in the Survey Area and local vicinity. The VT is not locally significant. | Associated with the widespread BVA 9 and multiple well-represented land systems (BB5, Moriarty System, and Gumland System) within the Coolgardie IBRA Bioregion. The VT is not regionally significant. |
| **VT15:** *Eucalyptus salmonophloia, Eucalyptus lesouefii* mid open woodland with *Eremophila dempsteri, Exocarpos aphyllus* tall sparse shrubland, over *Senna artemisioides* subsp. *filifolia, Atriplex nummularia* subsp. *spathulata, Eremophila scoparia* mid sparse shrubland, over *Atriplex vesicaria, Cratystylis conocephala, Rhagodia drummondii* low sparse shrubland | Associated with multiple BVAs in the area; **9**, **128**, **468**, and **936.** | Associated with multiple land systems in the area; **BB5**, **Mx43**, **Mx41**, **Mx42**, **Moriarty System**, and **Gumland System**. | VT15 was common in the Survey Area and was widespread in the combined Survey Areas. The plains/floodplain with common ironstone/quartz pebble landform it occurs on is widespread in the Survey Area and local vicinity. The VT is not locally significant. | Associated with widespread BVAs (9, 128, 468, and 936) and land systems (BB5, Mx43, Mx41, Mx42, Moriarty System, and Gumland System) in the area. The VT is not regionally significant. |

| Vegetation Type | Associated BVA | Associated Land System | Local Context & Discussion | Regional Context & Discussion |
|---|---|---|---|---|
| **VT16:** *+/-Eucalyptus griffithsii, Eucalyptus salmonophloia* mid open woodland with *Eremophila interstans* subsp. *virgata, Exocarpos aphyllus* tall sparse shrubland, over *Senna artemisioides* subsp. *filifolia, Eremophila ionantha, Acacia leptopetala* mid sparse shrubland, over *Lycium australe, Atriplex vesicaria, Rhagodia drummondii* low sparse shrubland | **936:** *Eucalyptus salmonophloia, Eucalyptus lesouefii*, and *Eucalyptus transcontinentalis* mid woodland, over *Atriplex* spp. open chenopod shrubland. | Associated with multiple land systems in the area; **Mx43**, **Mx42**, and **Gumland System.** | VT16 had a limited extent in the Survey Area but was widespread in the combined Survey Areas. The drainage lines and floodplains on flats landform it occurs on is widespread in the Survey Area and local vicinity. The VT is not locally significant. | Associated with a well-represented BVA (936) and multiple widespread land systems (Mx43, Mx42, and Gumland System) within the Coolgardie IBRA Bioregion. The VT is not regionally significant. |
| **VT17:** *Eucalyptus ravida, +/-Eucalyptus yilgarnensis* low woodland with *Eremophila dempsteri, +/-Melaleuca lanceolata*, Acacia *enervia* subsp. *enervia* tall sparse shrubland, over *Senna artemisioides* subsp. *filifolia, Exocarpos aphyllus, Eremophila ionantha* mid sparse shrubland, over *Scaevola spinescens, Eremophila clavata, Acacia resinistipulea* low sparse shrubland | No associated BVA for this VT. | **AC1:** Gently sloping to gently undulating plateau areas, or uplands, on granites, gneisses, and allied rocks, with long gentle slopes and, in places, abrupt erosional scarps.<br>**Mx42:** Broad flat to undulating valleys with isolated granitic rock outcrops and some low escarpments; some seasonal lakes and clay pans. | VT17 had a limited extent within the Survey Area. However, the flat plains of red-orange sandy clay landforms on which it occurs are widespread in the local area and as such the VT is not considered locally significant. | Associated with well-represented land systems within the Coolgardie IBRA Bioregion; AC1 and Mx42. The VT provides a role of refuge for the Priority Flora; *Eremophila acutifolia* (P3), which is not considered regionally significant. The VT is not regionally significant. |
| **VT18:** *Eucalyptus lesouefii* mid woodland with *Melaleuca sheathiana* tall open shrubland, over *Eremophila scoparia, Exocarpos aphyllus, Senna artemisioides* subsp. *filifolia* mid sparse shrubland, over *Olearia muelleri, Acacia erinacea* low sparse shrubland | **9:** *Eucalyptus torquata, Eucalyptus lesouefii*, and *Eucalyptus clelandii* low woodland, over *Eremophila scoparia, Eremophila glabra*, and *Eremophila oldfieldii* tall sparse shrubland. | Associated with multiple land systems in the area; **BB5**, **My154**, **Mx43**, and **Mx42.** | VT18 was widespread within the Survey Area. The plains and low rises with red orange sandy clay/ clay landform on which it occurs are also widespread in the local area and as such the VT is not considered locally significant. | Associated with a well-represented BVA (9) and multiple widespread land systems (BB5, My154, Mx43, and Mx42) within the Coolgardie IBRA Bioregion. The VT is not regionally significant. |
| **VT19:** *Eucalyptus salubris, Eucalyptus clelandiorum, +/-Eucalyptus salmonophloia* low woodland, over *Senna artemisioides* subsp. *filifolia, Eremophila scoparia, Exocarpos aphyllus* mid sparse shrubland, over *Eremophila caperata, Eremophila parvifolia* subsp. *auricampi, Olearia muelleri* low sparse shrubland | No associated BVA for this VT. | Associated with multiple land systems in the area; **My154**, **Mx41**, and **Moriarty System.** | VT19 had a limited extent in the Survey Area but was widespread in the combined Survey Areas. The flat plains with red orange sandy clay and continuous ironstone pebbles landform it occurs on is widespread in the Survey Area and local vicinity. The VT provides a role of refuge for the Priority taxa *Eremophila acutifolia* (P3) and *Notisia intonsa* (P3). However, neither are considered a locally significant taxon. | Associated with well-represented land systems within the Coolgardie IBRA Bioregion (My154, Mx41, and Moriarty System). The VT provides a role of refuge for the Priority taxa; *Eremophila acutifolia* (P3) and *Notisia intonsa* (P3), neither of which are not considered regionally significant. Therefore, The VT is not regionally significant. |

| Vegetation Type | Associated BVA | Associated Land System | Local Context & Discussion | Regional Context & Discussion |
|---|---|---|---|---|
| | | | Therefore, the VT is not locally significant. | |
| **VT20:** *Eucalyptus cylindrocarpa*, *Eucalyptus yilgarnensis* mid open mallee woodland with +/- *Melaleuca sheathiana* tall sparse shrubland, over *Senna artemisioides* subsp. *filifolia*, *Eremophila scoparia*, *Acacia leptopetala* mid sparse shrubland, over *Olearia muelleri*, *Westringia rigida* low sparse shrubland with *Triodia scariosa* low sparse hummock grassland | **128**: Bare areas; rock outcrops. | **Mx41:** Flat to undulating pediments marginal to unit AC1; granitic rock outcrop; some low escarpments.<br>**Mx42:** Broad flat to undulating valleys with isolated granitic rock outcrops and some low escarpments; some seasonal lakes and clay pans. | VT20 had a large extent within the combined Survey Areas. However, the VT provides a role of refuge for the locally significant Priority Flora taxon *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2). Therefore, the VT is considered locally significant. | Associated with a widespread BVA (128) and multiple well-represented land systems (Mx41 and Mx42). However, the VT provides a role of refuge for the regionally significant Priority Flora taxon *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2). Therefore, the VT is considered regionally significant. |
| **VT21:** *Eucalyptus celastroides*, *Eucalyptus transcontinentalis*, *Eucalyptus salubris* mid woodland, over *Eremophila scoparia*, *Senna artemisioides* subsp. *filifolia*, *Eremophila ionantha* mid sparse shrubland, over *Olearia muelleri*, *Acacia leptopetala*, *Eremophila clavata* low sparse shrubland | Associated with multiple BVAs in the area; **9**, **936**, and **522**. | Associated with multiple land systems in the area; **BB5**, **My154**, **My54**, **Mx41**, **Mx42**, **Mx43**, **Gumland System**, and **Moriarty System.** | VT21 has a large extent within the Survey Area and the landform (flat plains, red orange sand/sandy clay) appears widespread in the local area. The VT provides a role of refuge for the Priority Flora taxa; *Eremophila acutifolia* (P3) and *Eucalyptus urna* subsp. *xesta* (P3), however neither are considered a locally significant taxon. Therefore, the VT is not locally significant. | Associated with multiple well-represented BVAs (9, 936, and 522) and multiple widespread land systems (BB5, My154, My54, Mx41, Mx42, Mx43, Gumland System, and Moriarty System)., within the Coolgardie IBRA Bioregion. The VT provides a role of refuge for the Priority Flora taxa; *Eremophila acutifolia* (P3) and *Eucalyptus urna* subsp. *xesta* (P3), however neither are considered a regionally significant taxon. Therefore, the VT is not regionally significant. |
| **VT23:** *Allocasuarina campestris*, *Acacia collegialis*, *Acacia burkittii* tall open shrubland, over *Santalum spicatum* mid isolated shrubs, over *Prostanthera incurvata*, *Eremophila granitica*, *Pimelea microcephala* subsp. *microcephala* low sparse shrubland | **1413**: *Acacia* spp., *Allocasuarina campestris*, and *Melaleuca uncinata* tall shrubland. | **BB5:** Rocky ranges and hills of greenstones-basic igneous rocks. | VT23 has a restricted extent within the combined Survey Area. The moderate slopes of red orange sandy clay and continuous basalt stones and boulders landform of which it occurs appears widespread in the local area. However, the VT provides a role of refuge for the locally significant Priority Flora taxa; *Eucalyptus websteriana* subsp. *norsemanica* (P1) and *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2). Therefore, the VT is considered locally significant. | Associated with a widespread BVA (1413) and land system (BB5). However, the VT provides a role of refuge for the regionally significant Priority Flora taxon *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2). Therefore, the VT is considered regionally significant. |

| Vegetation Type | Associated BVA | Associated Land System | Local Context & Discussion | Regional Context & Discussion |
|---|---|---|---|---|
| VT24: *Acacia burkittii, Melaleuca hamata*, +/- *Brachychiton gregorii* tall shrubland, over *Eremophila granitica, Mirbelia depressa, Prostanthera grylloana* low sparse shrubland | 128: Bare areas; rock outcrops. | Mx41: Flat to undulating pediments marginal to unit AC1; granitic rock outcrop; some low escarpments.<br>My54: Broad very gently undulating plains with scattered rock outcrops occurring as mesas. | VT24 had a large extent within the combined Survey Areas. However, the VT provides a role of refuge for the locally significant Priority Flora taxa; *Lepidium genistoides* (P3) and *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2). Therefore, the VT is considered locally significant. | Associated with a widespread BVA and a well-represented land system (Mx41). However, the VT provides a role of refuge for the regionally significant Priority Flora taxon *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2). Therefore, the VT is considered regionally significant. |

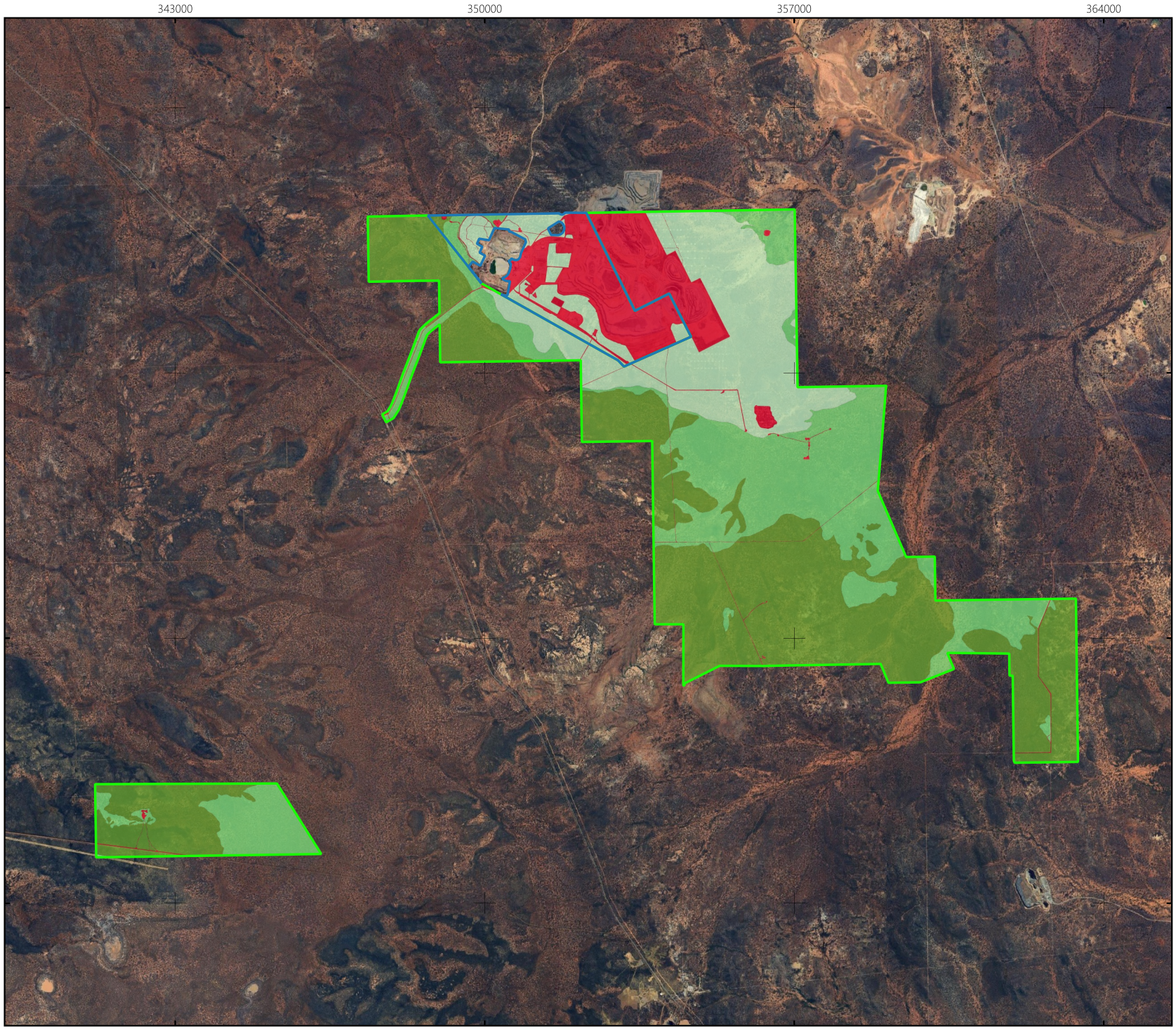
## 4.4. Vegetation Condition

The majority of the Survey Area was mapped as 'Pristine' (41.7%) showing no obvious signs of disturbance. Approximately 26.5% of the Survey Area was rated as 'Excellent' condition showing scattered weeds, low levels of grazing, and/or minor dust pollution from exploration activities or off-road driving. Approximately 20.2% was rated as 'Very Good' often in close proximity to previously cleared areas for infrastructure and drilling activities or areas with moderate to high weeds, dust and/or grazing present. The remaining 11.6% of the Survey Area was 'Completely Degraded', that included all areas that have been cleared for roads and infrastructure. Vegetation condition of the Survey Area is presented in Table 4.6 and mapped in Map 4.4.

Weeds were present, but not at high abundances within the Survey Area. No weeds were recorded as a dominant understory species in any of the VTs identified in the Survey Area.

Table 4.6: Vegetation Condition

| Condition | Area (ha) | % | Disturbance Detail in Survey Area |
|---|---|---|---|
| Pristine | 3534.6 | 41.7 | No obvious disturbance. |
| Excellent | 2245.3 | 26.5 | Scattered weeds, minor litter present, low levels of grazing and/or minor dust. Additionally, areas in close proximity to cleared tracks, logging activities or rehabilitation. |
| Very Good | 1716.6 | 20.2 | Moderate weed cover, moderate to high grazing, high dust present, low reductions in native vegetation structure and/or minor exploration activities in area. |
| Completely Degraded | 982.1 | 11.6 | No vegetation or plant species present, including roads, tracks, and areas cleared for infrastructure or drilling activities. |




## Legend

- M15/717 Survey Area
- MinRes Survey Area

**Vegetation Condition**

- Pristine
- Excellent
- Very Good
- Completely Degraded

N

0 1 2 3 4 km

Scale 1:120,000 @ A4

Coordinate System: GDA 2020 MGA Zone 51
Projection: Universal Transverse Mercator
Units: Metre

Spectrum ECOLOGY • SPATIAL

Author: ZG

Date: 20-09-2024

# Vegetation Condition

Mt Marion - MinRes & M15/717 Tenements - Detailed Flora & Vegetation Assessment

MAP

Prepared for
Mineral Resources Limited

4.4

# 5. CONCLUSION

## 5.1. Flora

No Threatened flora were recorded or considered likely to occur within the Survey Area. Seven Priority Flora taxa were recorded:

- Priority 1 (P1): *Acacia websteri*, *Ptilotus procumbens*, *Thryptomene planiflora*;
- Priority 2 (P2): *Phebalium clavatum;*
- Priority 3 (P3): *Cyathostemon verrucosus*, *Eremophila acutifolia*, *Eucalyptus urna* subsp. *xesta*.

Multiple populations of Sandalwood (*Santalum spicatum*), a controlled species under the BC Act, were recorded from seven locations in the Survey Area.

No Threatened or Priority Flora species were assigned a 'High' post-survey likelihood of occurrence at the Survey Area.

Of these taxa, two were assigned a high local or regional significance with the remaining assigned a low local and regional significance:

*Ptilotus procumbens* (P1) has high local and regional significance. This taxon has only one previous record within the vicinity of the Survey Area (located in Kalgoorlie town in 1978) with the next closest record more than 100km north near Charlie Dam, indicating that it may have limited distribution locally, and restricted regionally within the Coolgardie IBRA Bioregion.

*Phebalium clavatum* (P2) has a high regional significance. This taxon is locally common but has a limited distribution within the Coolgardie IBRA Bioregion with just six records taken within the past 25 years.

One of the introduced flora recorded in the Survey Area, **Tamarix aphylla*, is a declared pest and WoNS under the BAM Act (Government of Western Australia, 2007).

## 5.2. Vegetation

Based on the definitions of significant vegetation listed in section 2.4.4 (Environmental Protection Authority, 2016a) VT01, VT02, VT13, VT20, VT23, and VT24 are considered significant as they act as a role as refuge (providing habitat) for locally and/or regionally significant Priority Flora.

VT01 covers just 36.2 ha (0.5%) of the Survey Area and provides a role as refuge for the regionally significant Priority Flora taxon *Phebalium clavatum* (P2). Therefore, VT01 is considered regionally significant. VT01 also provides a role of refuge for another two Priority Flora taxa, *Cyathostemon verrucosus* (P3), and *Thryptomene planiflora* (P1).

VT02 covers 167.1 ha (2.2%) of the Survey Area and provides a role as refuge for the regionally significant Priority Flora taxon *Phebalium clavatum* (P2). Therefore, VT02 is considered regionally significant.

VT13 covers 1,234.0 ha (16.4%) of the Survey Area and provides a role as refuge for the locally and regionally significant *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2). Therefore, VT13 is considered locally and regionally significant. VT13 also provides a role of refuge for the Priority Flora taxon, *Eremophila acutifolia* (P3).

VT20 covers 91.1 ha (1.2%) and provides a role as refuge for the locally and regionally significant Priority Flora taxon *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2). Therefore, VT20 is considered locally and regionally significant.

VT23 covers 11.5 ha (0.2%) and provides a role as refuge to the locally significant Priority Flora taxon, *Eucalyptus websteriana* subsp. *norsemanica* (P1) and the locally and regionally significant taxon, *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2). Therefore, VT23 is considered locally and regionally significant.

VT24 covers 357.4 ha (4.8%) and provides a role as refuge to the locally significant Priority Flora taxon, *Lepidium genistoides* (P3) and the locally and regionally significant taxon, *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2). Therefore, VT24 is considered locally and regionally significant.

No GDEs were identified in the Survey Area.

Four of the five significant vegetation from the literature review assigned 'Medium' likelihood of occurrence during the desktop assessment, were given a 'High' likelihood of occurrence post-survey, as the survey effort recorded similar VTs to those identified in the desktop assessment that supported Priority listed flora.

Vegetation condition varied within VTs based on disturbances (clearing, weeds, grazing, dust) and proximity to cleared tracks. The majority of the Survey Area was mapped as 'Pristine' (41.7%), with no signs of obvious disturbances. The remainder of the Survey Area was mapped as 'Excellent' (26.5%), 'Very Good' (20.2%), or 'Completely Degraded' (11.6%). Weeds were present, but not at high abundances within the Survey Area. No weeds were recorded as a dominant understory species in any of the VTs identified in the Survey Area.

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# Appendix A: Conservation Codes

## Appendix A1: Definitions of Conservation Categories under the EPBC Act

| Category | Definition |
|---|---|
| **Extinct** | A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died. |
| **Extinct in the Wild** | A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time:<br>(a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or<br>(b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form. |
| **Critically Endangered** | A native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria. |
| **Endangered** | A native species is eligible to be included in the endangered category at a particular time if, at that time:<br>(a) it is not critically endangered; and<br>(b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria. |
| **Vulnerable** | A native species is eligible to be included in the vulnerable category at a particular time if, at that time:<br>(a) it is not critically endangered or endangered; and<br>(b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria. |
| **Conservation Dependent** | A native species is eligible to be included in the conservation dependent category at a particular time if, at that time:<br>(a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered, or critically endangered; or<br>(b) the following subparagraphs are satisfied:<br>(i) the species is a species of fish;<br>(ii) the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised;<br>(iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory;<br>(iv) cessation of the plan of management would adversely affect the conservation status of the species. |

## Appendix A2: Definitions of Conservation Categories Under the BC Act

| Code | Definition (BC Act) |
|---|---|
| **Threatened Species (T)**<br>Listed by order of the Minister as Threatened in the category of critically endangered, endangered, or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the Biodiversity Conservation Act 2016 (BC Act).<br>**Threatened fauna** is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for Threatened Fauna.<br>**Threatened flora** is that subset of 'Rare Flora' listed under schedules 1 to 3 of the Wildlife Conservation (Rare Flora) Notice 2018 for Threatened Flora.<br>The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below. | |
| Critically Endangered (CR) | 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".<br>Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under **schedule 1** of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for critically endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for critically endangered flora. |
| Endangered (EN) | 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".<br>Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under **schedule 2** of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for endangered flora. |
| Vulnerable (VU) | 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".<br>Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under **schedule 3** of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for vulnerable fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for vulnerable flora. |

| Code | Definition (BC Act) |
|---|---|
| **Extinct species**<br>Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild. | |
| Extinct species (EX) | 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).<br>Published as presumed extinct under **schedule 4** of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for extinct fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for extinct flora. |
| Extinct in the wild species (EW) | 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).<br>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**<br>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.<br>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. | |
| Migratory species (MI) | 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).<br>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.<br>Published as migratory birds protected under an international agreement under **schedule 5** of the Wildlife Conservation (Specially Protected Fauna) Notice 2018. |
| Conservation Dependent (CD) | 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).<br>Published as conservation dependent fauna under **schedule 6** of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 |
| Other specially protected fauna (OS) | 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).<br>Published as other specially protected fauna under **schedule 7** of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 |
| **Priority species (P)**<br>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.<br>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.<br>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. | |
| Priority 1: Poorly known species (P1) | 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. |

| Code | Definition (BC Act) |
|---|---|
| Priority 2: Poorly known species (P2) | Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey. |
| Priority 3: Poorly known species (P3) | 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 need further survey. |
| Priority 4: Rare, Near Threatened and other species in need of monitoring (P4) | (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.<br>(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.<br>(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy. |

## Appendix A3: Legal Status Definition of Listed Plants in Western Australia

| Legal Status | Definition |
|---|---|
| Declared Pest, Prohibited – s12 | Prohibited organisms are declared pests by virtue of section 22(1) and may only be imported and kept subject to permits. |
| Declared Pest – s22(2) | Declared pests must satisfy any applicable import requirements when imported and may be subject to control keeping requirements. |
| Permitted – s11 | Permitted organisms must satisfy applicable import requirements and import permits (where required). |
| Permitted, Requires Permit – r73 | Regulation 73 permitted organisms may be subject to restriction under legislation other than the BAM Act (2007). |
| Unlisted | Unlisted organisms are prohibited in WA. |
| **Control Categories** | **Definition** |
| C1 Exclusion | Organisms should be excluded from parts or all of WA. |
| C2 Eradication | Organisms should be eradicated from all or parts of WA. |
| C3 Management | Organisms should have some form of management applied that will alleviate the harmful impact of the organism, reduce the numbers or distribution of the organism, or prevent or contain the spread of the organism. |
| Unassigned | Declared pest that are recognised as having a harmful impact under certain circumstances where their subsequent control requirements are determined by a plan or other legislative arrangements under the Act. |
| **Keeping Categories** | **Definition** |
| Prohibited keeping | Can only be kept under a permit for public display, education, or scientific purposes. |
| Restricted keeping | Kept under a permit by private individuals due to a low risk of becoming a problem for the environment. |
| Exempt keeping | No permit or conditions are required for keeping. Organism may be subject to restrictions under the Wildlife Conservation Act (WCA, 1950). |

# Appendix B: Flora Site Data

Insert Min Res Site Sheets pages 75 to 110

# Appendix C: Likelihood of Occurrence Assessment – Flora

| Pre- survey likelihood | Post-survey likelihood | Status | EPBC Act/BC Act | Family | Taxon | Description | Habitat | Closest Record (km) | Likelihood Notes | Lifeform | Flowering Period |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Recorded | Recorded | P1 | -/- | Myrtaceae | *Thryptomene planiflora* | - | Gentle undulating and flat yellow brown sandy loam plains. | 0 | Recorded within the Survey Area. | Perennial | Jun to Oct |
| Recorded | Recorded | P3 | -/- | Scrophulariaceae | *Eremophila acutifolia* | Low, dense, rounded shrub, 0.3-0.8 m high. Fl. white. | Clay loam, gravelly loam. Undulating flats. | 0 | Recorded within the Survey Area. | Perennial | Nov to Dec. |
| Recorded | Recorded (outside Survey Area) | P3 | -/- | Ericaceae | *Styphelia rectiloba* | Compact, erect .shrub to 70cm high. | Lateritic/granitic breakaways. | 0 | Recorded within the Survey Area. | Perennial | Jan |
| High | Medium | P1 | -/- | Orchidaceae | *Pterostylis xerampelina* | - | Granite/Ironstone hills. | 1 | Recorded within 10 km of the Survey Area with land system, geology, and vegetation match. | Annual | Sep to Nov |
| High | Recorded | P1 | -/- | Fabaceae | *Acacia websteri* | Shrub, 1.2-5 m high, bark fibrous. Fl. yellow. | Red sand, clay, or loam. Low-lying areas, flats. | 1 | Recorded within 10 km of the Survey Area with land system, geology, and vegetation match. | Perennial | Jan, Jun. |
| High | Recorded | P2 | -/- | Rutaceae | *Phebalium clavatum* | Upright shrub, 0.5-1.5 m high. Fl. white. | Sandy soils. | 2 | Recorded within 10 km of the Survey Area with land system, geology, and vegetation match. | Perennial | Aug to Sept |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| High | Medium | P1 | -/- | Myrtaceae | *Cyathostemon divaricatus* | Erect straggly shrub to 1 m high, 0.8 m wide, white to pale pink flowers. | Hills. | 4 | Recorded within 10 km of the Survey Area with land system, geology, and vegetation match. | Perennial | Aug. |
| High | Medium | P3 | -/- | Fabaceae | *Acacia crenulata* | Bushy shrub or tree, 0.7-3 m high. Fl. yellow. | Clay, sandy clay, yellow sand. Rocky rises, granite outcrops, breakaways. | 5 | Recorded within 10 km of the Survey Area with land system, geology, and vegetation match. | Perennial | April. |
| High | Medium | P3 | -/- | Scrophulariaceae | *Eremophila microphylla* | Rounded shrub, 0.45-0.9 m high, to 1 m wide. | Red-brown clay loam. | 6 | Recorded within 10 km of the Survey Area with land system, geology, and vegetation match. | Perennial | Nov to Dec. |
| High | Medium | P3 | -/- | Stylidiaceae | *Stylidium choreanthum* | Creeping perennial, herb, 0.01-0.03 m high, to 0.3 m wide. Fl. pink/white. | White/yellow or red sand. Plains. | 6 | Recorded within 10 km of the Survey Area with land system, geology, and vegetation match. | Perennial | Sep to Oct |
| High | Medium | P1 | -/- | Cyperaceae | *Lepidosperma lyonsii* | Tufted rhizomatous, perennial, herb (sedge), leaves 0.31 to0.53 m high, culms and leaves distichous. | Pale orange skeletal sandy loam with banded ironstone gravel & rock, well-drained shallow stony loamy with quartz. Gentle hill slopes, upper slopes of large hill. | 7 | Recorded within 10 km of the Survey Area with land system, geology, and vegetation match. | Perennial | - |
| High | Medium | P1 | -/- | Cyperaceae | *Lepidosperma* sp. Parker Range (N. Gibson & M. Lyons 2094) | Sedge. | Ridge/slope. Granite. Dry brown loam. | 7 | Recorded within 10 km of the Survey Area with land system, geology, and vegetation match. | - | - |

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| High | Medium | P3 | -/- | Brassicaceae | *Phlegmatospermum eremaeum* | Prostrate to spreading annual, herb, 0.02-0.1(-0.2) m high. Fl. white-cream. | Stony loam. | 7 | Recorded within 10 km of the Survey Area with land system, geology, and vegetation match. | Annual | Jun or Aug to Oct. |
| High | Medium | P3 | -/- | Rhamnaceae | *Cryptandra crispula* | Non-spinescent shrub, 0.25-0.9 m high. | Brown sandy clay, yellow loamy sand, red soil, pebbles. Dune ridges, hills, near salt lakes. | 7 | Recorded within 10 km of the Survey Area with land system, geology, and vegetation match. | Perennial | Jul to Sep |
| High | Medium | P1 | -/- | Montiaceae | *Calandrinia lefroyensis* | Perennial herb, 30-40 cm high x 10-20 cm wide. Twining succulent herb, flowers dark pink, present within low shrubs. | Clay pans and salt flats. | 8 | Recorded within 10 km of the Survey Area however limited habitat match. | Perennial | Apr, Oct to Nov. |
| High | Medium | P2 | -/- | Fabaceae | *Acacia kerryana* | Low, spreading, domed shrub, 0.3-1 m high. Fl. yellow. | Granitic loamy sand, stony clayey loam, or clayey sand. Low stony ridges, undulating plains. | 9 | Recorded within 10 km of the Survey Area with habitat match | Perennial | Oct to Dec or Jan to Feb. |
| High | Medium | P1 | -/- | Euphorbiaceae | *Ricinocarpos digynus* | - | Hillslope. Dry, rocky red-brown sandy loam. | 9 | Recorded within 10 km of the Survey Area with some land system, geology, and vegetation match. | - | - |
| High | Medium | P3 | -/- | Casuarinaceae | *Allocasuarina eriochlamys* subsp. *grossa* | Dioecious or monoecious shrub, 1-3 m high, bracteoles | Stony loam, laterite clay. Granite outcrops. | 9 | Recorded within 10 km of the Survey Area, with habitat match | Perennial | Jul. |

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| | | | | | | prominently exceeding cone. | | | | | |
| High | Medium | P2 | -/- | Cyperaceae | *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) | - | Rocky areas. | 9 | Recorded within 10 km of the Survey Area with land system, geology, and vegetation match. | - | - |
| High | Medium | P3 | -/- | Asteraceae | *Cratystylis centralis* | Much-branched, brittle, greyish shrub, to 1 m high. | Red sandy loam with ironstone gravel. Flat plains, breakaway country. | 9 | Recorded within 10 km of the Survey Area with land system, geology, and vegetation match. | - | Aug to Nov |
| High | Medium | P4 | -/- | Scrophulariaceae | *Eremophila caerulea subsp. merrallii* | Spreading or sprawling shrub, to 0.35 m high, to 0.8 m wide. Fl. blue purple. | Sand, clay or loam. Undulating plains. | 9 | Recorded within 10 km of the Survey Area with land system, geology, and vegetation match. | Perennial | Oct to Dec. |
| High | Low | T | -/- | Elaeocarpaceae | *Tetratheca spenceri* | - | Breakaway system, lateritic soil with tantalite. | 9 | Recorded within 10 km of the Survey Area with some land system, geology, and vegetation match. | - | Oct |
| Medium | Low | P2 | -/- | Chenopodiaceae | *Tecticornia flabelliformis* | Erect shrub, to 0.2 m high. | Saline flats. | 14 | Recorded within 30 km of the Survey Area with limited habitat match (Saline Flats) | Perennial | Jan to May. |
| Medium | Low | P3 | -/- | Poaceae | *Austrostipa turbinata* | Tussock grass to 0.4m. | Clay pan, basalt slopes. | 15 | Recorded within 30 km of the Survey Area with land system, geology, and vegetation match. | Perennial | April, Oct to Nov. |

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| Medium | Low | P4 | -/- | Myrtaceae | *Eucalyptus* x *brachyphylla* | (Mallee) or tree, to 4 m high, bark rough, flaky. Fl. white. | Sandy loam. Granite outcrops. | 16 | Land system, geology, and vegetation match but, recorded outside 10 km of the Survey Area | Perennial | Jun. |
| Medium | Low | P3 | -/- | Myrtaceae | *Melaleuca coccinea* | Much branched shrub, 1.5-2.6 m high. | Sandy loam over granite. Granite outcrops, sandplain, river valleys. | 17 | Recorded within 30 km of the Survey Area with limited habitat match (Saline Flats) | Perennial | Sep to Nov, or Jan. |
| Medium | Low | P4 | -/- | Frankeniaceae | *Frankenia glomerata* | Prostrate shrub. Fl. pink, white. | White sand. | 19 | Recorded within 30 km of the Survey Area however limited habitat match (Saline Flats) | Perennial | Nov. |
| Medium | Low | P1 | -/- | Chenopodiaceae | *Tecticornia mellarium* | - | Sand dunes near Salt Lake. Brown, red-orange sand, sandy clay. | 21 | Recorded within 30 km of the Survey Area with limited habitat match (Saline Flats) | - | - |
| Medium | Low | P2 | -/- | Scrophulariaceae | *Eremophila praecox* | Broom-like shrub, 1.5-3 m high. Fl. purple. | Red/brown sandy loam. Undulating plains. | 21 | Land system, geology, and vegetation match but, recorded outside 10 km of the Survey Area | Perennial | Oct or Dec. |
| Medium | Low | P2 | -/- | Goodeniaceae | *Goodenia salina* | Annual, herb, 0.02 to 0.2 m high. | Well-drained, saline, grey or brown loamy clay. Low gypseous dunes near salt pans. | 21 | Recorded within 30 km of the Survey Area however limited habitat match (Saline Flats) | Annual | May, Aug to Nov |
| Medium | Low | P3 | -/- | Cyperaceae | *Isolepis australiensis* | Annual, grass-like or herb (sedge), 0.03-0.055 m high. | Silty sand, sandy clay. Lake margins, pools. | 21 | Recorded within 30 km of the Survey Area with limited habitat match (Saline Flats) | Annual | Jun or Sept. |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium | Low | P3 | -/- | Asteraceae | *Notisia intonsa* | Annual herb. | Moist red sand. Lake bank. | 23 | Recorded within 30 km of the Survey Area with land system, geology, and vegetation match. | Annual | - |
| Medium | Low | P3 | -/- | Apocynaceae | *Alyxia tetanifolia* | Erect, rigid, pungent shrub, 1-2 m high, to 2.5 m wide. Fl. white-cream. | Sandy clay, loam, concretionary gravel. Drainage lines, near lakes. | 25 | Land system, geology, and vegetation match but, recorded outside 10 km of the Survey Area | Perennial | May to June, Nov. |
| Medium | Low | P3 | -/- | Proteaceae | *Grevillea georgeana* | Erect to widely spreading shrub, 1-3 m high, up to 4 m wide. Fl. red/red & pink & cream. | Stony loam/clay. Ironstone hilltops & slopes. | 25 | Recorded within 30 km of the Survey Area with land system, geology, and vegetation match. | Perennial | Jan, Mar, Sept to Nov. |
| Medium | Low | P3 | -/- | Fabaceae | *Bossiaea celata* | Compact, intricately branched shrub, to 0.8 m high. Fl. yellow-red-orange. | Deep sand. Open mallee. | 26 | Land system, geology, and vegetation match but, recorded outside 10 km of the Survey Area | Perennial | Sep to Oct |
| Medium | Low | P1 | -/- | Goodeniaceae | *Dampiera plumosa* | Erect perennial, herb, 0.15-0.2 m high. Fl. blue. | Red sandy soils. | 26 | Recorded within 30 km of the Survey Area with land system, geology, and vegetation match. | Perennial | Oct. |
| Medium | Low | P3 | -/- | Scrophulariaceae | *Eremophila veronica* | Spreading, erect shrub, 0.5-1 m high. Fl. purple. | Stony clay, clay loam. Lateritic breakaways. | 26 | Recorded within 30 km of the Survey Area with land system, geology, and vegetation match. | Perennial | Apr to May. |
| Medium | Low | P4 | -/- | Myrtaceae | *Eucalyptus jutsonii* subsp. *jutsonii* | (Mallee), 4-7 m high, bark rough over most stem, | Red to pale orange deep sands. Undulating areas and on dunes. | 26 | Land system, geology, and vegetation match but, recorded outside 10 km of the Survey Area | Perennial | Mar, Nov. |

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| | | | | | | grey to light grey, brown. | | | | | |
| Medium | Low | P1 | -/- | Fabaceae | *Acacia coatesii* | Low-domed shrub <40 cm. | Grows in shallow, red sandy clay on flat or gently sloping ground towards the base of a low greenstone ridge in open woodland dominated by Eucalyptus spp. over open shrubland. | 27 | Recorded within 30 km of the Survey Area with land system, geology, and vegetation match. | Perennial | Sept to Oct. |
| Medium | Low | 27 | -/- | Poaceae | *Austrostipa frankliniae* | Tussock grass to 0.4m. | Basalt crest or slopes. | 27 | Recorded within 30 km of the Survey Area with land system, geology, and vegetation match. | Perennial | Oct to Nov. |
| Medium | Low | P2 | -/- | Fabaceae | *Bossiaea laxa* | Lax, open, spreading shrub, to 2 m high. Fl. yellow green. | Brown loam over deep granite. Sheltered positions around outcrops. | 27 | Geology and vegetation match and recorded outside 10 km of the Survey Area | Perennial | May |
| Medium | Low | P1 | -/- | Myrtaceae | *Eucalyptus websteriana* subsp. *norsemanica* | (Spreading mallee), to 3 m high, bark 'Minni-ritchi'. Fl. yellow. | Rocky rises. | 27 | Recorded within 30 km of the Survey Area with land system, geology, and vegetation match. | Perennial | Sept to Nov. |
| Medium | Low | P3 | -/- | Myrtaceae | *Melaleuca macronychia* subsp. *trygonoides* | Multi-stemmed, spreading shrub, 1-4 m high, leaves broadly elliptic. Fl. red. | Sandy soils. Granite outcrops. | 28 | Recorded outside 30 km of the Survey Area with some habitat match | - | Aug or Oct. |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Low | Low | P1 | -/- | Rutaceae | *Philotheca apiculata* | Erect shrub, 0.5-1.5 m high. Fl. white, pink. | Stony clay loam. Rocky outcrops, hillsides. | 31 | Recorded outside 30 km of the Survey Area with some habitat match | - | Aug to Nov. |
| Low | Recorded | P1 | -/- | Amaranthaceae | *Ptilotus procumbens* | Spreading procumbent annual, herb, ca 0.1 m high. Fl. pink, white. | Red clay. | 32 | Nearest record located within Kalgoorlie town | Annual | Nov. |
| Low | Low | P1 | -/- | Lamiaceae | *Prostanthera splendens* | Erect, openly branched shrub, 0.2-1 m high. Fl. blue purple. | Stony loam, shallow soils with ironstone pebbles. Breakaways. | 34 | Recorded outside 30 km of the Survey Area with some habitat match | - | Aug to Oct |
| Low | Low | P1 | -/- | Amaranthaceae | *Ptilotus rigidus* | Shrubs, stem several, more or less prostrate. | Quartz / rocky low hill. | 35 | Recorded outside 30 km of the Survey Area and only geology match | - | - |
| Low | Low | T | -/- | Fabaceae | *Gastrolobium graniticum* | Erect, open shrub, to 2.5 m high. Fl. yellow, orange, and red. | Sand, sandy loam, granite. Margins of rock outcrops, along drainage lines. | 36 | Nearest record is within Coolgardie town with no accurate spatial data. Plus, records taken in 1899 and 1902. Next closest record is 36km from Survey Area. | Perennial | Aug to Sep. |
| Low | Low | P3 | -/- | Lamiaceae | *Pityrodia scabra subsp. dendrotricha* | Shrub. | Flat on drainage line to lake edge. Dry red-orange sandy loam. | 36 | Recorded outside 30 km of the Survey Area with some habitat match | - | - |
| Low | Low | P2 | -/- | Asteraceae | *Elachanthus pusillus* | Ascending or decumbent annual, herb, to 0.15 m | In mallee, woodland, | 37 | Land system, geology, and vegetation match | Annual | Aug to Oct. |

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| | | | | | | high. Fl. yellow green. | shrubland and coastal vegetation. | | but, recorded outside 10 km of the Survey Area | | |
| Low | Low | P3 | -/- | Brassicaceae | *Lepidium fasciculatum* | Erect annual, herb, (0.1-)0.3-0.6 m high. | Dry lakebed. Flat. Soil red loam. | 37 | Nearest record located within Kalgoorlie town | Annual | - |
| Low | Low | P3 | -/- | Scrophulariaceae | *Eremophila arachnoides* subsp. *tenera* | Broom-like shrub, to 3 m high, branches with tubercules often elongated & coalescing. Fl. white/blue purple. | Plain. | 38 | Recorded outside 30 km of the Survey Area, limited habitat match | Perennial | Sep to Dec |
| Low | Low | P2 | -/- | Araliaceae | *Trachymene pyrophila* | Annual, herb, 0.1-0.5 m high, indumentum of patent glandular hairs. Fl. white. | Yellow or orange sand. Sandplains; germinating after fire or other disturbances such as mining. | 38 | Geology and vegetation match, but recorded outside 30 km of the Survey Area | Annual | Nov to Dec or Jan to Mar. |
| Low | Low | P3 | -/- | Scrophulariaceae | *Eremophila annosicaulis* | Small, slightly aromatic shrub to 0.8 m tall with one or a number of branches arising from ground level, the wood very gnarled. | Ironstone. | 38 | Recorded outside 30 km of the Survey Area, limited habitat match | Perennial | Jul, Sep |
| Low | Low | P1 | -/- | Scrophulariaceae | *Eremophila perglandulosa* | Low, spreading, viscid shrub, ca 0.25 m high. Fl. blue purple. | Orange/brown sand or sandy loam. | 39 | Recorded outside 30 km of the Survey Area with no habitat match | Perennial | Jan. |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Low | Low | P1 | -/- | Fabaceae | *Acacia sclerophylla* var. *teretiuscula* | Spreading, much-branched shrub, 0.25-2.5 m high. Fl. yellow. | Clay & loamy soils. | 39 | Land system, geology, and vegetation match but, recorded outside 30 km of the Survey Area | Perennial | Sept to Oct. |
| Low | Low | P2 | -/- | Proteaceae | *Hakea rigida* | Shrub, 0.6-2.7 m high. | Sandy soils, yellow sand. | 39 | Recorded outside 30 km of the Survey Area with some habitat match | Perennial | Sept to Oct. |
| Low | Low | P1 | -/- | Rutaceae | *Phebalium appressum* | Rounded shrub, ca 1 m high, leaves cordate-ovate, ca 2 mm long; flowers usually solitary; pedicels short, thick, ca 1 mm long. Flowers, white. | Yellow sandplain. | 39 | Land system, geology, and vegetation match but, recorded outside 10 km of the Survey Area | Perennial | Jul. |
| Low | Low | P2 | -/- | Asteraceae | *Chrysocephalum apiculatum* subsp. *norsemanense* | Erect perennial herb 0.3-0.6 m high. | Various soil types including yellow or red sand, yellow sandy clay, and calcareous soil. | 40 | Recorded 10-16km west of Coolgardie and 40 km from the Survey Area with land system, geology, and vegetation match. | Perennial | Sep to Oct. |
| Low | Recorded | P3 | -/- | Myrtaceae | *Cyathostemon verrucosus* | Low spreading perennial shrub to 50-60 cm. | Yellow sand. Flat plains. | 40 | Recorded outside 30 km of the Survey Area, some habitat match | Perennial | Mar to Dec. |
| Low | Low | P1 | -/- | Scrophulariaceae | *Eremophila xantholaemus* | Erect shrub to 1.2-3.0 m high. Flowers pink. | Stony, brown loam soils in Eucalyptus-Casuarina woodland on the | 40 | Recorded outside 30 km of the Survey Area, some habitat match | Perennial | Sept to Oct. |

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| | | | | | | | upper slopes of low rocky hills. | | | | |
| Low | Low | P1 | -/- | Ericaceae | *Melichrus* sp. Coolgardie (K.R. Newbey 8698) | - | Flat or undulating yellow loamy sand | 43 | Recorded outside 30 km of the Survey Area with some habitat match | - | - |
| Low | Low | P1 | -/- | Proteaceae | *Grevillea phillipsiana* | Prickly shrub, 0.8-1.5 m high. Fl. red/red & orange. | Red sand, stony loam. Granite hills. | 45 | Recorded outside 30 km of the Survey Area with some habitat match | Perennial | Jul to Sep. |
| Low | Low | P3 | -/- | Myrtaceae | *Eucalyptus frenchiana* | Mallet to 12 m high. Smooth grey bark, peeling in long strips revealing creamy - light brown bark. Fruit obconical, deeply ribbed. No more than 3's in fruit umbels. | Loam, sandy loam. | 47 | Recorded outside 30 km of the Survey Area, some habitat match | Perennial | Oct. |
| Low | Low | P3 | -/- | Dilleniaceae | *Hibbertia pachyphylla* | Shrub, to 0.5 m high. Fl. yellow. | White to yellow sand, brown sandy gravel, gravelly loam, laterite, granite, quartz. Undulating plains, low rises, valley floors. | 49 | Recorded outside 30 km of the Survey Area, some habitat match | - | Sep to Nov. |
| Low | Low | P3 | -/- | Ericaceae | *Styphelia saxicola* | - | Laterite/duricrust outcropping. Dry | 49 | Land system, geology, and vegetation match | - | Apr to May. |

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| | | | | | | | orange/salmon/white clay loam. | | but, recorded outside 10 km of the Survey Area | | |
| Low | Low | P1 | -/- | Myrtaceae | *Thryptomene* sp. Coolgardie (E. Ks.n. 1902) | Perennial shrub. | Sandplain. Orange sandy flats. | - | Nearest record was taken within Coolgardie town in 1902, not an accurate record and the only one | Perennial | - |
| Low | Low | P2 | -/- | Brassicaceae | *Lepidium merrallii* | Erect to spreading annual (possibly ephemeral), herb, 0.03-0.15 m high. | Clay loam. | - | Nearest record was taken within Coolgardie town in 1902, not an accurate record and the only one | Annual | - |
| Low | Low | P3 | -/- | Malvaceae | *Alyogyne* sp. Great Victoria Desert (D.J. Edinger 6212) | - | Black soil, freshwater swamp. | - | Nearest record was taken within Coolgardie town in 1902, not an accurate record and the only one | - | - |
| Low | Low | P4 | -/- | Asparagaceae | *Sowerbaea multicaulis* | Tufted perennial, herb, 0.075-0.25 m high. Fl. purple violet. | Yellow-brown sand. | - | Nearest recorded taken in 1897 within a Salt Lake and no match to habitat. | Perennial | Oct to Dec or Jan. |
| Not identified in desktop assessment | Recorded | P3 | -/- | Myrtaceae | *Eucalyptus urna* subsp. *xesta* | Mallee/Mallet up to 15m high, Bark white/cream/grey and some orange with ribbons, leaves dull, fruits smooth. | Flat plain with light red sand with some ironstone medium gravel. | >85 | - | Perennial | |

# Appendix D: Flora Species List

| Family | Species | Comment |
|---|---|---|
| Aizoaceae | *Sarcozona praecox* | |
| Amaranthaceae | *Ptilotus drummondii* | |
| | *Ptilotus exaltatus* | |
| | *Ptilotus gaudichaudii* | |
| | *Ptilotus grandiflorus* | |
| | *Ptilotus holosericeus* | |
| | *Ptilotus obovatus* | |
| | *Ptilotus procumbens* (P1) | Priority 1 |
| Apiaceae | *Daucus glochidiatus* | |
| | *Platysace trachymenioides* | |
| Apocynaceae | *Alyxia buxifolia* | |
| | *Leichhardtia australis* | |
| | *Vincetoxicum lineare* | |
| Asparagaceae | *Lomandra effusa* | |
| | *Thysanotus manglesianus* | |
| Asteraceae | *Actinobole uliginosum* | |
| | *Brachyscome lineariloba* | |
| | *Calotis hispidula* | |
| | *Centaurea melitensis** | Weed |
| | *Cratystylis conocephala* | |
| | *Cratystylis microphylla* | |
| | *Gnephosis tenuissima* | |
| | *Hypochaeris glabra** | Weed |
| | *Olearia muelleri* | |
| | *Olearia pimeleoides* | |
| | *Oncosiphon suffruticosum** | Weed |
| | *Ozothamnus cassiope* | |
| | *Podolepis aristata* subsp. *affinis* | |
| | *Pogonolepis muelleriana* | |
| | *Schoenia cassiniana* | |
| | *Siemssenia capillaris* | |
| | *Sonchus oleraceus** | Weed |
| | *Streptoglossa liatroides* | |
| | *Triptilodiscus pygmaeus* | |
| | *Waitzia acuminata* var. *acuminata* | |
| | *Waitzia fitzgibbonii* | |
| Boraginaceae | *Halgania andromedifolia* | |
| | *Halgania cyanea* var. Charleville (R.W. Purdie +111) | |
| | *Halgania integerrima* | |
| Campanulaceae | *Lithotoma petraea* | |

| Family | Species | Comment |
|---|---|---|
| Casuarinaceae | *Allocasuarina acutivalvis* subsp. *acutivalvis* | |
| | *Allocasuarina campestris* | |
| | *Allocasuarina corniculata* | |
| | *Allocasuarina helmsii* | |
| Celastraceae | *Stackhousia* sp. Mt Keith (G. Cockerton & G. O'Keefe 11017) | |
| Centrolepidaceae | *Centrolepis strigosa* subsp. *rupestris* | |
| Chenopodiaceae | *Atriplex nummularia* subsp. *spathulata* | |
| | *Atriplex stipitata* | |
| | *Atriplex vesicaria* | |
| | *Chenopodium curvispicatum* | |
| | *Enchylaena tomentosa* var. *tomentosa* | |
| | *Eriochiton sclerolaenoides* | |
| | *Maireana carnosa* | |
| | *Maireana erioclada* | |
| | *Maireana georgei* | |
| | *Maireana pentatropis* | |
| | *Maireana pyramidata* | |
| | *Maireana radiata* | |
| | *Maireana tomentosa* subsp. *tomentosa* | |
| | *Maireana trichoptera* | |
| | *Maireana triptera* | |
| | *Rhagodia crassifolia* | |
| | *Rhagodia drummondii* | |
| | *Sclerolaena cuneata* | |
| | *Sclerolaena diacantha* | |
| | *Sclerolaena drummondii* | |
| | *Sclerolaena fusiformis* | |
| | *Sclerolaena parviflora* | |
| Cupressaceae | *Callitris preissii* | |
| Cyperaceae | *Lepidosperma sanguinolentum* | |
| | *Schoenus subaphyllus* | |
| Dilleniaceae | *Hibbertia pungens* | |
| Ericaceae | *Leucopogon* sp. Boorabbin (K.R. Newbey 8374) | |
| | *Leucopogon* sp. Clyde Hill (M.A. Burgman 1207) | |
| | *Leucopogon* sp. Coolgardie (M. Hislop & F. Hort MH 3197) | |
| Euphorbiaceae | *Beyeria lechenaultii* | |
| | *Beyeria sulcata* | |
| Fabaceae | *Acacia acuaria* | |
| | *Acacia andrewsii* | |
| | *Acacia burkittii* | |

| Family | Species | Comment |
|---|---|---|
| | *Acacia calcarata* | |
| | *Acacia camptoclada* | |
| | *Acacia collegialis* | |
| | *Acacia coolgardiensis* | |
| | *Acacia dempsteri* | |
| | *Acacia densiflora* | |
| | *Acacia duriuscula* | |
| | *Acacia enervia* subsp. *enervia* | |
| | *Acacia eremophila* var. *eremophila* | |
| | *Acacia erinacea* | |
| | *Acacia gibbosa* | |
| | *Acacia jennerae* | |
| | *Acacia leptopetala* | |
| | *Acacia merrallii* | |
| | *Acacia multispicata* | |
| | *Acacia prainii* | |
| | *Acacia resinimarginea* | |
| | *Acacia resinistipulea* | |
| | *Acacia tetragonophylla* | |
| | *Acacia websteri* (P1) | Priority 1 |
| | *Daviesia aphylla* | |
| | *Indigofera occidentalis* | |
| | *Mirbelia depressa* | |
| | *Senna artemisioides* subsp. *filifolia* | |
| | *Senna artemisioides* subsp. *x artemisioides* | |
| | *Senna cardiosperma* | |
| | *Swainsona canescens* | |
| | *Templetonia ceracea* | |
| Frankeniaceae | *Frankenia interioris* | |
| Goodeniaceae | *Coopernookia strophiolata* | |
| | *Dampiera tenuicaulis* var. *curvula* | |
| | *Goodenia havilandii* | |
| | *Goodenia krauseana* | |
| | *Scaevola spinescens* | |
| Haloragaceae | *Glischrocaryon angustifolium* | |
| | *Haloragis trigonocarpa* | |
| Hemerocallidaceae | *Dianella revoluta* var. *divaricata* | |
| Lamiaceae | *Cyanostegia angustifolia* | |
| | *Prostanthera althoferi* subsp. *althoferi* | |
| | *Prostanthera grylloana* | |

| Family | Species | Comment |
|---|---|---|
| | *Prostanthera incurvata* | |
| | *Salvia verbenaca** | Weed |
| | *Westringia cephalantha* | |
| | *Westringia cephalantha* var. *cephalantha* | |
| | *Westringia rigida* | |
| Malvaceae | *Brachychiton gregorii* | |
| | *Commersonia craurophylla* | |
| | *Malva weinmanniana* | |
| | *Seringia velutina* | |
| Myrtaceae | *Acacia gibbosa* | |
| | *Apectospermum subtenue* | |
| | *Astus subroseus* | |
| | *Calytrix birdii* | |
| | *Chamelaucium ciliatum* | |
| | *Cyathostemon verrucosus* (P3) | Priority 3 |
| | *Ericomyrtus serpyllifolia* | |
| | *Eucalyptus campaspe* | |
| | *Eucalyptus celastroides* | |
| | *Eucalyptus clelandiorum* | |
| | *Eucalyptus griffithsii* | |
| | *Eucalyptus leptopoda* subsp. *subluta* | |
| | *Eucalyptus lesouefii* | |
| | *Eucalyptus longissima* | |
| | *Eucalyptus oleosa* subsp. *oleosa* | |
| | *Eucalyptus pileata* | |
| | *Eucalyptus platycorys* | |
| | *Eucalyptus ravida* | |
| | *Eucalyptus rigidula* | |
| | *Eucalyptus salmonophloia* | |
| | *Eucalyptus salubris* | |
| | *Eucalyptus stricklandii* | |
| | *Eucalyptus torquata* | |
| | *Eucalyptus transcontinentalis* | |
| | *Eucalyptus urna* | |
| | *Eucalyptus urna* subsp. *xesta* (P3) | Priority 3 |
| | *Eucalyptus yilgarnensis* | |
| | *Homalocalyx thryptomenoides* | |
| | *Leptospermopsis erubescens* | |
| | *Leptospermopsis fastigiata* | |
| | *Melaleuca acuminata* | |

| Family | Species | Comment |
|---|---|---|
| | *Melaleuca eleuterostachya* | |
| | *Melaleuca fulgens* subsp. *fulgens* | |
| | *Melaleuca hamata* | |
| | *Melaleuca lanceolata* | |
| | *Melaleuca lateriflora* | |
| | *Melaleuca pauperiflora* subsp. *fastigiata* | |
| | *Melaleuca sheathiana* | |
| | *Melaleuca zeteticorum* | |
| | *Micromyrtus erichsenii* | |
| | *Thryptomene australis* subsp. *brachyandra* | |
| | *Thryptomene planiflora* (P1) | Priority 1 |
| | *Verticordia chrysantha* | |
| | *Verticordia helmsii* | |
| Pittosporaceae | *Pittosporum angustifolium* | |
| Poaceae | *Amphipogon caricinus* var. *caricinus* | |
| | *Aristida contorta* | |
| | *Austrostipa elegantissima* | |
| | *Austrostipa nitida* | |
| | *Austrostipa scabra* subsp. *scabra* | |
| | *Monachather paradoxus* | |
| | *Paspalidium basicladum* | Range Extension |
| | *Pentameris airoides* subsp. *airoides** | Weed |
| | *Rytidosperma acerosum* | |
| | *Schismus arabicus** | Weed |
| | *Triodia rigidissima* | |
| | *Triodia scariosa* | |
| | *Vulpia muralis** | Weed |
| Proteaceae | *Grevillea acacioides* | |
| | *Grevillea acuaria* | |
| | *Grevillea huegelii* | |
| | *Grevillea nematophylla* subsp. *nematophylla* | |
| | *Hakea francisiana* | |
| | *Hakea minyma* | |
| | *Persoonia helix* | |
| | *Persoonia saundersiana* | |
| Pteridaceae | *Cheilanthes sieberi* subsp. *sieberi* | |
| Rhamnaceae | *Cryptandra aridicola* | |
| | *Cryptandra crispula* | |
| | *Stenanthemum stipulosum* | |
| | *Trymalium myrtillus* | |

| Family | Species | Comment |
|---|---|---|
| | *Trymalium myrtillus* subsp. *myrtillus* | |
| Rutaceae | *Cyanothamnus coerulescens* subsp. *spinescens* | |
| | *Phebalium canaliculatum* | |
| | *Phebalium clavatum* (P2) | Priority 2 |
| | *Phebalium filifolium* | |
| | *Phebalium laevigatum* | |
| | *Phebalium tuberculosum* | |
| Santalaceae | *Exocarpos aphyllus* | |
| | *Santalum acuminatum* | |
| | *Santalum murrayanum* | Range Extension |
| | *Santalum spicatum* | |
| Sapindaceae | *Dodonaea adenophora* | |
| | *Dodonaea amblyophylla* | |
| | *Dodonaea lobulata* | |
| | *Dodonaea microzyga* var. *acrolobata* | |
| | *Dodonaea stenozyga* | |
| | *Dodonaea viscosa* subsp. *angustissima* | |
| Scrophulariaceae | *Eremophila acutifolia* (P3) | Priority 3 |
| | *Eremophila alternifolia* | |
| | *Eremophila caperata* | |
| | *Eremophila clavata* | |
| | *Eremophila decipiens* subsp. *decipiens* | |
| | *Eremophila dempsteri* | |
| | *Eremophila glabra* subsp. *glabra* | |
| | *Eremophila granitica* | |
| | *Eremophila interstans* subsp. *interstans* | |
| | *Eremophila ionantha* | |
| | *Eremophila oldfieldii* subsp. *angustifolia* | |
| | *Eremophila oppositifolia* subsp. *angustifolia* | |
| | *Eremophila parvifolia* subsp. *auricampi* | |
| | *Eremophila rugosa* | |
| | *Eremophila scoparia* | |
| Solanaceae | *Lycium australe* | |
| | *Nicotiana goodspeedii* | |
| | *Nicotiana rotundifolia* | |
| | *Solanum nummularium* | |
| | *Solanum plicatile* | |
| Stylidiaceae | *Stylidium dielsianum* | |
| Tamaricaceae | *Tamarix aphylla** | Weed/Range Extension |
| Zygophyllaceae | *Roepera compressa* | |