



Reconnaissance
Flora and Vegetation Survey
for the Mt Marion Project Area- June
2019

**(Hamptons Lease Area 53, M15/353, M15/717,
M15/999, M15/1000, L15/220, L15/360, L15/376 and
L15/392)**

Prepared for



Mineral Resources Ltd

FINAL V2.0
June 2019

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1. INTRODUCTION

Mineral Resources Ltd (MRL) by its subsidiary Process Minerals International Pty Ltd (PMI) are collaborating to develop the Mt Marion Lithium Project. This proposed area falls within Hamptons Lease Area 53, mining tenements M15/353, M15/717, M15/999, M15/1000 and miscellaneous licenses L15/220, L15/360, L15/376 and L15/392.

A survey area was provided by MRL to Native Vegetation Solutions (NVS) and is located approximately 36km south of Kalgoorlie in the Coolgardie Bioregion of Western Australia (Figure 1). The total survey area received from MRL covers approximately 6,326.61 ha and surrounds the current Mt Marion pit and waste landform. This report describes the combined results of multiple flora and vegetation surveys conducted within the survey area, which will be utilised for future mining proposals and clearing permit applications.



Figure 1: Regional map of survey location

The entire survey area constitutes multiple survey dates in six different areas. The six areas are differentiated by date and displayed in Table 1 below:

Table 1: Survey Dates

ID	Survey Type	Start Date	End Date	Effort	General Date	Area (ha)
1	Reconnaissance Flora and Vegetation Survey	9/05/2012	10/05/2012	2 Days, 2 people	2012	280.12
2	Reconnaissance Flora and Vegetation Survey	22/01/2013	20/03/2013	5 Days, 2 people	2013	5191.85
3	Reconnaissance Flora and Vegetation Survey	3/11/2015	12/11/2015	3 Days, 1 person	2015	633.74
4	Reconnaissance Flora and Vegetation Survey	12/09/2017	12/09/2017	7.5 hours, 1 person	Sep 2017	63.88
5	Reconnaissance Flora and Vegetation Survey	23/11/2017	23/11/2017	5 hours, 1 person	Nov 2017	36.37
6	Reconnaissance Flora and Vegetation Survey	4/07/2018	4/07/2018	10.5 hours, 1 person	2018	120.67

1.1 Objectives

The objective of this report is to document and combine all previous survey results of reconnaissance assessments conducted in accordance with:

- *Environmental Factor Guideline- Flora and Vegetation* (EPA, 2016); and
- *Technical Guidance- Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016a).

A reconnaissance assessment has two components:

- 1). Desktop study which includes a literature review and a search of the relevant databases;
- 2). Reconnaissance survey of the survey area to verify the desktop survey, to define vegetation units present in the area, search for species of conservation significance and to determine potential sensitivity to impact.

As part of the reporting for the reconnaissance assessment, NVS has conducted a Flora and Vegetation Survey which includes broad-scale vegetation mapping and vegetation condition mapping of the survey area.

The scope of work for the Reconnaissance flora and vegetation survey was:

- conduct a desktop study that includes a literature review and search of the relevant databases;
- describe the vegetation associations in the survey area;
- prepare an inventory of species occurring in the survey area;
- identify and target any vegetation communities or flora species of conservation significance;
- Map broad-scale vegetation groups found within the survey area, including vegetation condition; and
- provide recommendations, including the management of perceived impacts to flora and vegetation within the survey area.

1.2 Geology and Vegetation

According to the Interim Biogeographic Regionalisation of Australia (IBRA, 2018), the survey area lies in the Coolgardie (COO) bioregion within the Eastern Goldfields (COO03) subregion which totals over 5.1 million hectares (CALM, 2002). The COO03 subregion lies on the Yilgarn Craton's 'Eastern Goldfields Terrains'. The relief is subdued and comprises of gently undulating plains interrupted in the west with low hills and ridges of Archaean greenstones and in the east by a horst of Proterozoic basic granulite. The general underlying geology of the Coolgardie Bioregion

is of gneisses and granites eroded into a flat plane covered with tertiary soils and with scattered exposures of bedrock. Calcareous earths are the dominant soil group and cover much of the plains and greenstone areas. A series of large playa lakes in the western half are the remnants of an ancient major drainage line. The vegetation is of Mallees, *Acacia* thickets and shrubheaths on sandplains. Diverse *Eucalyptus* woodlands occur around salt lakes, on ranges, and in valleys. Salt lakes support dwarf shrublands of samphire. Woodlands and *Dodonaea* shrubland are known to occur on basic granulites of the Fraser Range some distance to the southeast of the survey area (CALM, 2002).

1.3 Climate

The subregion climate is Arid to Semi-arid with 200-300 mm of rainfall, sometimes in summer but usually in winter (CALM, 2002).

The nearest official meteorological weather station with the most complete and up to date information is Kalgoorlie- Boulder Airport, which is located approximately 32 km north of the survey area. Recordings of the local climatic conditions commenced at Kalgoorlie-Boulder in 1939 (BOM, 2019) and data collected at this station 012038 was used for this report.

1.3.1 Temperature

Mean annual minimum temperature at Kalgoorlie is 11.7°C and mean annual maximum temperature is 25.3°C. The coldest temperatures occur in July (mean minimum temperature 5.0°C), the hottest is January (mean maximum temperature 33.7°C) and diurnal temperature variations are relatively consistent throughout the year (Figure 2).

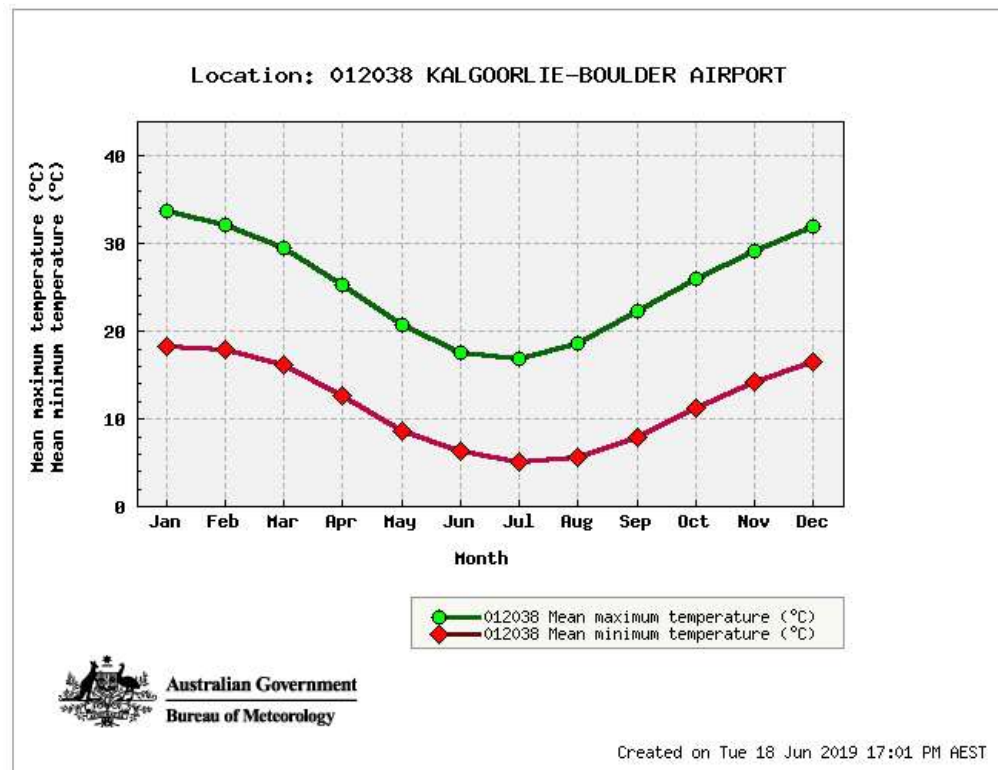


Figure 2: Mean temperature ranges for Kalgoorlie-Boulder weather station

1.3.2 Rainfall

The annual average rainfall at Kalgoorlie is 267.7mm over an average 39.9 rain days. Average rainfall varies across the months, with slightly larger rainfall events falling between January to March and May to July (Figure 3), and the least rainfall received in September. Total rainfall for 2012 and 2015 was below average, whilst 2013, 2017 and 2018 were above average. In March

2012 three times the average rainfall occurred before the survey work in May. In 2015 double the average rainfall occurred in August and November before the survey work.

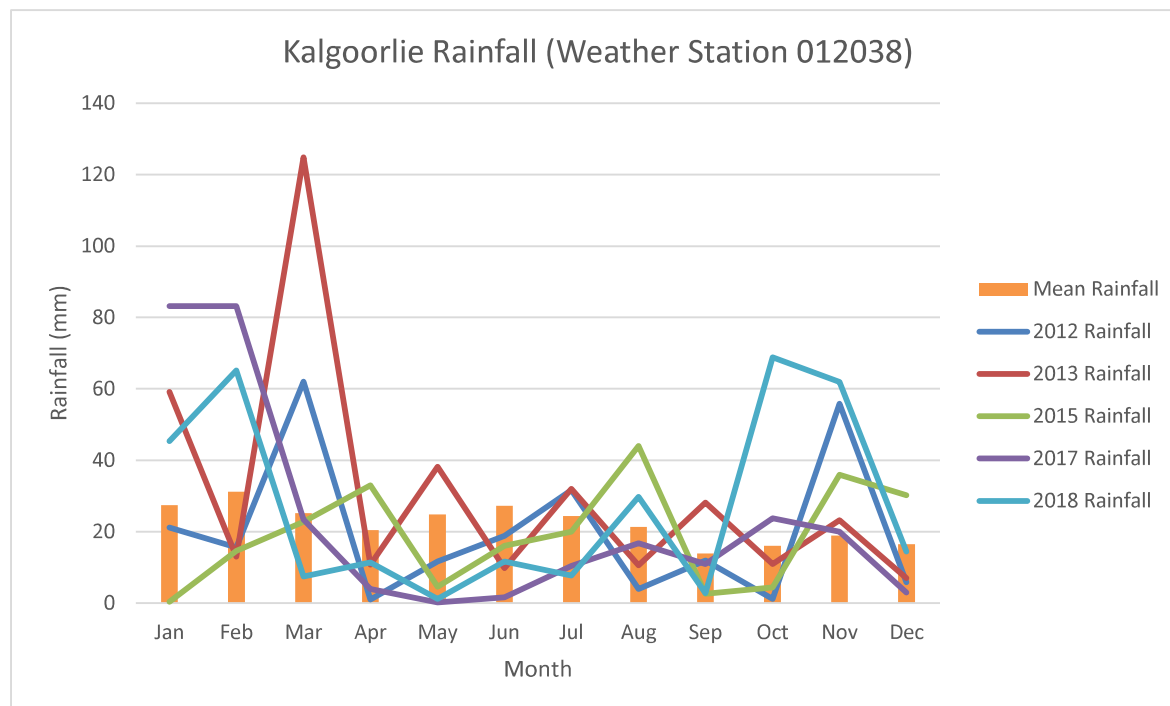


Figure 3: Kalgoorlie-Boulder Weather Station Rainfall

2. ASSESSMENT METHODOLOGY

2.1 Personnel and Reporting

The following personnel were involved in the reconnaissance flora and vegetation survey:

- Mr Eren Reid (*BSc- Biological Science*), Principal Botanist, Native Vegetation Solutions, undertook the survey, vegetation mapping, data collation, field identification of flora, preparation and review of the report.
- Ashley Owen *DipSc*, Botanist/Consultant, Native Vegetation Solutions, undertook the survey and data collation.
- Mr Frank Obbens (*BSc*), Consultant Botanist, Bushtech Consultancy, undertook identification of unknown plant taxa collected in the field.

2.2 Preliminary Desktop Study

A preliminary assessment of the survey area and its potential constraints was undertaken by reviewing relevant government agency managed databases (Sections 2.2.1 to 2.2.6, and Appendices 1 & 2) and consulting with government agencies where necessary. The following sections provide a summary of desktop searches undertaken for the project.

2.2.1 Environment Protection and Biodiversity Conservation Act Protected Matters

The *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* Protected Matters Search tool was utilised to provide results for matters of National Environmental Significance within a 1 km buffer encompassing the survey area. (Search coordinates provided in Appendix 1) (<http://www.environment.gov.au/arcgis-framework/apps/pmst/pmst-coordinate.jsf>)

2.2.2 Threatened Flora and Communities

The Species and Communities Branch of the Department of Biodiversity, Conservation and Attractions (DBCA) was contacted for a search of their databases containing known populations of threatened flora within a 40km radial area of GPS coordinates GDA94 51J 345200mE 6563700mN (Reference: 10-1115FL). Threatened flora include Declared Rare Flora (DRF- extant, now redefined as 'Threatened') and Priority Flora.

The presence of Threatened and Priority Ecological Communities (TECs & PECs) was determined by examining Geographic Information System (GIS) data supplied by the DBCA upon request within a 40km radial area of GPS coordinates GDA94 51J 345200mE 6563700mN (Reference: 09-01115EC).

2.2.3 Environmentally Sensitive Areas (ESAs) and Conservation Reserves

The Department of Water and Environmental Regulation (DWER, 2019) Clearing Permit System Map Viewer was used to determine the location of any ESAs and Conservation Reserves (<https://cps.dwer.wa.gov.au/main.html>).

2.2.4 Vegetation Type, Extent and Status

Vegetation extent and status data was sourced from the Department of Agriculture and Food (DAFWA) report "Land-Use and Vegetation in Western Australia- National Land and Water Resources Audit Report" and its associated GIS file (Shepherd *et al*, 2002). This data comprises Beard's Pre-European vegetation groups.

DBCA's Statewide Vegetation Statistics (DBCA, 2019) was also referenced for the current extent of Beard's Vegetation Groups.

2.2.5 Wetlands

The potential of wetlands within the project area was determined by examining DWER's Clearing Permit System Map Viewer (DWER, 2019). (<https://cps.dwer.wa.gov.au/main.html>).

2.2.6 Dieback

Dieback is only considered a potential issue for the project if both the mean annual rainfall of the area is >400mm, and if the project area resides below the 26th parallel.

2.3 Site Investigation

A site visit was carried out by Botanist Eren Reid and Consultant Ashley Owen from Native Vegetation Solutions from the 9th to 10th May 2012, 22nd of January 2013, 21st February 2013, 13th, 14th and 20th of March 2013, 3rd, 4th and 12th November 2015, 12th September 2017, 23rd November 2017 and 4th July 2018 to examine the flora and vegetation groups contained within the survey area. A total of 13 days (227-man hours) was spent on site traversing the survey area, by Kawasaki Mule and on foot.

A map of traverses conducted through the survey area as well as the sample locations are included in Appendix 4.

The survey was conducted in accordance with relevant EPA's Statements and Guidelines (Section 1.1).

Threatened Flora were targeted during the field surveys, particularly Declared Rare Flora- Extant (DRF).

The EPA uses the Interim Biogeographic Regionalisation of Australia (IBRA) as the largest unit for Environmental Impact Assessment decision making in relation to the conservation of biodiversity. Given the scale and nature of the proposed disturbance as well as the existing

disturbance, and that the survey area is located within the Coolgardie IBRA region, a reconnaissance flora and vegetation survey was deemed adequate, as previous Detailed Flora Surveys have also been completed in with the survey area.

2.3.1 Licenses

Flora was collected for identification under numerous Scientific Collection Licenses held by Mr E R Reid:

- SL009444- expiry 17/05/2012
- SL010070- expiry 28/06/2013
- SL011497- expiry 09/07/2016
- SL012187- expiry 18/09/2018

2.3.2 Field Methods

Prior to the field work, the aerial photography was examined and representative sample sites for relevés were chosen to provide coverage over all viable vegetation types.

In the field, these sites were visited and non-permanent 20 x 20m relevé sites were established in appropriate locations, considering representativeness of the site to surrounding vegetation and vegetation boundaries. Relevé sites are represented in Appendix 4.

Each relevé site was captured on a TwoNav Aventura GPS at $\pm 4\text{m}$ accuracy, using Universal Transverse Mercator location on GDA94 datum. Digital photographs were taken of each representative vegetation group present in the survey area.

Data collected at each relevé included:

- Photograph of representative vegetation group:
- GPS Location:
- Species Present;
- Population Count/Estimate of Conservation Significant Flora (if present);
- Disturbance Level; and
- Vegetation Condition

Specimens of taxa not recognised by the Botanists were collected and pressed along with specimens of taxa recognised as, or thought to be, conservation-significant species.

The condition of each relevé was assessed using the method developed by Keighery (1994). Definitions of the condition scale are presented in Appendix 3.

Vegetation groups were mapped (section 2.3.4 below).

Opportunistic sampling of plant taxa and vegetation group mapping was also utilised in the survey area between relevé sampling points, via wandering traverses. Smaller singular relevé sites were also utilised as opportunistic sample sites to collect flora specimens and assist in mapping vegetation groups.

All sample sites, relevés and GPS tracks are included in Appendix 4.

2.3.3 Post-Field Methods

Unknown specimens collected in the field were identified post field work initially by Eren Reid with reference to published keys, NVS' reference herbarium and information published on Florabase (WAHERB, 2019). Further unknown specimens were referred to Frank Obbens for identification.

Species information was transferred into Microsoft Excel® worksheets representing presence/absence of species per vegetation group.

2.3.4 Mapping

Vegetation mapping was produced via GPS recorded information in the field, cross-referenced with vegetation descriptions made in the field, overlaid on aerial imagery of the survey area. The GPS utilized (TwoNav Aventura GPS) displayed aerial imagery, hence real-time mapping of vegetation groups was available during field work.

Vegetation Health Condition was assessed in the field with reference to Keighery (1994).

GPS tracks and waypoints recorded during field work are presented in Appendix 4.

2.3.5 IBSA Data Package

The Environmental Protection Authority (EPA), Department of Water and Environmental Regulation (DWER) and Department of Mines, Industry Regulation and Safety (DMIRS) require Index of Biodiversity Surveys for Assessments (IBSA) Data Packages to be submitted to support assessment and compliance under the *Environmental Protection Act 1986*.

An IBSA data package is a single file in .zip format, containing:

- one **Metadata and Licensing Statement** in .pdf format;
- one **survey report** in .pdf format;
- one **plain-text survey report** in .txt format; and
- a set of electronic data files, comprising:
 - one **survey details** spatial dataset in shapefile (.shp, etc.) or MapInfo (.tab, etc.) format; and
 - one or more **survey data** spatial datasets, as required, in shapefile (.shp, etc.) or MapInfo (.tab, etc.) format.

It must be noted here that a majority of the field work for this survey area was completed prior to IBSA Data package requirements. NVS has to the best of its ability attempted to provide as much information from previous surveys to include in the IBSA Data package.

2.4 Limitations

Table 1 lists potential limitations that may have affected the survey. As shown, this survey was not limited by any factors listed below.

Table 2: List of potential survey limitations

Potential Limitations	Constraint (Y/N)	Comment
Competency and experience of the consultants undertaking the survey	N	Mr Eren Reid is an experienced botanist who has conducted many flora and vegetation surveys in the Goldfields, Pilbara and South-west regions of WA.
Proportion of flora identified during survey	N	As the survey was planned to target flora within a survey area over a number of different seasons, sufficient identifications were made to allow vegetation descriptions to be made, whilst Threatened Flora could be targeted.
Sources of information	N	Threatened and Priority Flora GIS information was available from DBCA.
Proportion of the task achieved	N	All tasks completed
Timing/Season	N	The targeted surveys were conducted in May 2012, Summer to Autumn 2013, Spring 2015, Spring 2017 and Winter 2018. Due to above average rains prior to field work intervals, sufficient emergent annuals were present.
Disturbance in survey area	N	Disturbance was present in the form of grazing and historic exploration.
Intensity of survey effort	N	Transects were walked through the survey area with all parts visited
Resources	N	Adequate resources were available
Access problems	N	No problems with access
Availability of contextual information on the region	N	Information on the Coolgardie Bioregion is readily available.

3. RESULTS

3.1 Preliminary Desktop Assessment

3.1.1 EPBC Act Protected Matters

The EPBC Protected Matters search tool revealed that the survey area could possibly be suitable habitat for Endangered Plant species *Gastrolobium graniticum* (Granite Poison). This species is generally restricted to granite outcrops.

The EPBC Protected Matters search tool also revealed that the survey area could possibly be suitable habitat for weed species *Carrichtera annua* (Wards Weed). *C. annua* was introduced into Australia from the eastern Mediterranean, and is now widespread throughout South Australia, the Interior, and Western Australia (Lamp & Collet, 1999). This species is not listed as a declared plant by DPIRD (2019), however according to the EPBC search tool this invasive weed species is considered a threat to the rangeland biodiversity within the Southern Australian Sheep and Cattle Grazing Land Management Zone (DOTEE, 2019).

The EPBC Protected Matters report indicated no TEC's or Commonwealth Reserves within a 1km buffer region of survey area. However, the search did reveal that the Yallari Timber Reserve which is a State and Territory Reserve is within or nearby the 1km buffer zone of the search area.

The results of the EPBC Protected Matters search are included in Appendix 1

3.1.2 Threatened Flora and Communities

The DBCA database searches revealed that 3 Threatened and 67 Priority Flora species occur within a 40km radius of the survey area (DBCA, 2015a). These taxa are considered to have the potential to occur within the survey area, based on their proximity and similar habitat. None of

these known locations occur within the survey area, while the closest location occurs approximately 1.09km away from the south eastern section of the survey area (DBCA, 2015a).

Results of the threatened flora database search are included in Appendix 2.

The PEC/TEC search (DBCA, 2015) revealed that there are no TECs or PECs within the survey area.

The three Threatened flora (DRF-Extant) revealed in the DBCA Database search results were *Acacia sciophanes*, *Gastrolobium graniticum* and *Tetradlea spenceri*.

Acacia sciophanes occurs in yellow sandy areas, while *Gastrolobium graniticum* occurs on margins of large granite rock outcrops. *Tetradlea spenceri* was discovered in 2012 and thus far only occurs at one location 18km south of the survey area on some low lateritic outcrops, restricted to a dark band of possibly iron-rich soil.

3.1.3 Environmentally Sensitive Areas and Conservation Reserves

The Clearing Permit System Map Viewer revealed that the survey area does not occur within any ESA's or Nature Reserves (DWER, 2019). The closest DBCA Managed land was the Class C Yallari Timber Reserve located on the western side of the Coolgardie-Esperance Highway (DWER, 2019). This Timber Reserve is vested with the Conservation Commission for the purpose of Timber Production, however, is considered by the DBCA as an area for the conservation of flora and fauna.

The Karamindie State Forrest Reserve adjoins the northern boundary of the survey area and is gazetted with the Conservation Commission. This State Forrest was gazetted in 1925 and is considered to contain some of the best examples of cut and uncut, arid-zone eucalypt woodland in the Goldfields.

3.1.4 Vegetation Type, Extent and Status

Information relating to known vegetation within the survey area has been summarised in Tables 3, 4, 5, 6 and 7 below. This information has been compiled through both desktop assessments and the site visit.

Table 3: Summary of information regarding Pre-European and current vegetation extent of Vegetation Association 9 within the survey area

Factor	Value				
Beard Vegetation Association*	9				
Vegetation Association Description*	Medium woodland; coral gum (<i>E. torquata</i>) & Goldfields blackbutt (<i>E. lesouefii</i>)				
Pre-European Extent (ha)	Scale				
	By Association (WA)	By Association (WA)	By IBRA Region (COO)	By IBRA Sub-region (COO03)	By Shire (Shire of Coolgardie)
	244,735*	240,509**	240,441**	235,047**	166,572**
% Pre-European Extent Remaining	100%*	97.78%**	97.78%**	97.75%**	98.29%**
Surrounding Land Use***	Mining, Exploration, Prospecting, Pastoral Lease				
Weed prevalence***	Low				

* Source: Shepherd *et al.* (2002) Appendix 2

**Source: DBCA, (2019)

*** Source: Field Assessment

Table 4: Summary of information regarding Pre-European and current vegetation extent of Vegetation Association 128 within the survey area

Factor	Value				
Beard Vegetation Association*	128				
Vegetation Association Description*	Bare areas; rock outcrops				
Pre-European Extent (ha)	Scale				
	By Association (WA)	By Association (WA)	By IBRA Region (COO)	By IBRA Sub-region (COO03)	By Shire (Shire of Coolgardie)
	503,092*	329,836**	184,549**	26,871**	96,232**
% Pre-European Extent Remaining	60.14%*	87.56%**	99.64%**	99.93%**	99.98%**
Surrounding Land Use***	Mining, Exploration, Prospecting, Pastoral Lease				
Weed prevalence***	Low				

* Source: Shepherd *et al.* (2002) Appendix 2

**Source: DBCA, (2019)

*** Source: Field Assessment

Table 5: Summary of information regarding Pre-European and current vegetation extent of Vegetation Association 522 within the survey area

Factor	Value				
Beard Vegetation Association*	522				
Vegetation Association Description*	Medium woodland; redwood (<i>E. transcontinentalis</i>) & merri (E. <i>flocktoniae</i>)				
Pre-European Extent (ha)	Scale				
	By Association (WA)	By Association (WA)	By IBRA Region (COO)	By IBRA Sub-region (COO03)	By Shire (Shire of Coolgardie)
	676,324*	709,714**	688,406**	208,175**	313,238**
% Pre-European Extent Remaining	100%*	99.93%**	99.93%**	99.78%**	99.86%**
Surrounding Land Use***	Mining, Exploration, Prospecting, Pastoral Lease				
Weed prevalence***	Low				

* Source: Shepherd *et al.* (2002) Appendix 2

**Source: DBCA, (2019)

*** Source: Field Assessment

Table 6: Summary of information regarding Pre-European and current vegetation extent of Vegetation Association 936 within the survey area

Factor	Value				
Beard Vegetation Association*	936				
Vegetation Association Description*	Medium woodland; salmon gum				
Pre-European Extent (ha)	Scale				
	By Association (WA)	By Association (WA)	By IBRA Region (COO)	By IBRA Sub-region (COO03)	By Shire (Shire of Coolgardie)
	924,675*	698,752**	586,792**	310,897**	359,112**
% Pre-European Extent Remaining	96.46%*	96.84%**	99.58%**	99.22%**	99.32%**
Surrounding Land Use***	Mining, Exploration, Prospecting, Pastoral Lease				
Weed prevalence***	Low				

* Source: Shepherd *et al.* (2002) Appendix 2

**Source: DBCA, (2019)

*** Source: Field Assessment

Table 7: Summary of information regarding Pre-European and current vegetation extent of Vegetation Association 1413 within the survey area

Factor	Value				
Beard Vegetation Association*	1413				
Vegetation Association Description*	Shrublands; <i>Acacia</i> , <i>Casuarina</i> & <i>Melaleuca</i> thicket				
Pre-European Extent (ha)	Scale				
	By Association (WA)	By Association (WA)	By IBRA Region (COO)	By IBRA Sub-region (COO03)	By Shire (Shire of Coolgardie)
	1,981,503*	1,679,916**	1,061,212**	107,974**	334,488**
% Pre-European Extent Remaining	67.05%*	76.60%**	98.24%**	99.77%**	99.93%**
Surrounding Land Use***	Mining, Exploration, Prospecting, Pastoral Lease				
Weed prevalence***	Low				

* Source: Shepherd *et al.* (2002) Appendix 2

**Source: DBCA, (2019)

*** Source: Field Assessment

3.1.5 Wetlands

No wetlands which are recorded on the DWER Clearing Permit System Map Viewer occur within the survey area (DWER, 2019).

3.1.6 Dieback

The survey area lies south of the 26th parallel, however receives average annual rainfall of 267.7mm, below the 400mm threshold mark. There is no record of *Phytophthora cinnamomi* establishing in natural ecosystems in regions receiving <400mm rainfall per annum (CALM, 2003). Therefore, Dieback is not considered an issue for this survey area, however all measures should be taken to prevent any possible soil contamination within the survey area which could proliferate during seasonally favourable conditions.

3.2 Field Assessment

3.2.1 Threatened Flora

No flora located in the survey area, are gazetted as Threatened pursuant to Section 5(1) of the *Biodiversity Conservation Act 2016*. No plant taxa listed as Threatened pursuant to Schedule 1 of the *Environment Protection and Biodiversity Conservation Act 1999* were located within the survey area.

Twenty-eight populations of Priority species *Diocirea acutifolia* (P3) were recorded covering a total area of 64.07ha (Appendix 4).

The boundary of each population was walked with a GPS unit in order to obtain the surface area, whilst several random temporary 20m x 20m quadrats were established within populations across the area, to count the number of plants contained within, to calculate an average number of plants within these populations.

A total of 69,686 plants have been calculated to occur within these 28 populations (Table 8), based on the method mentioned above.

Table 8: Priority Flora locations recorded during the survey

Species	Conservation Status	Population ID	LONGITUDE	LATITUDE	Area (ha)	Estimated Population Size
<i>Diocirea acutifolia</i>	P3	1	121.438053	-31.062317	0.857	1054
<i>Diocirea acutifolia</i>	P3	2	121.437356	-31.063511	0.238	293
<i>Diocirea acutifolia</i>	P3	3	121.439408	-31.064894	0.388	477
<i>Diocirea acutifolia</i>	P3	4	121.438736	-31.066602	16.299	20048
<i>Diocirea acutifolia</i>	P3	5	121.441059	-31.06416	1.246	1532
<i>Diocirea acutifolia</i>	P3	6	121.43581	-31.070317	2.110	2596
<i>Diocirea acutifolia</i>	P3	7	121.421381	-31.069168	1.871	2301
<i>Diocirea acutifolia</i>	P3	8	121.436303	-31.069658	0.371	456
<i>Diocirea acutifolia</i>	P3	9	121.442833	-31.070096	0.751	924
<i>Diocirea acutifolia</i>	P3	10	121.442797	-31.069661	1.217	1497
<i>Diocirea acutifolia</i>	P3	11	121.445177	-31.070111	0.435	535
<i>Diocirea acutifolia</i>	P3	12	121.445198	-31.069655	0.290	357
<i>Diocirea acutifolia</i>	P3	13	121.418973	-31.073311	3.120	3510
<i>Diocirea acutifolia</i>	P3	14	121.421614	-31.077927	13.929	8706
<i>Diocirea acutifolia</i>	P3	15	121.447254	-31.070855	1.862	2328
<i>Diocirea acutifolia</i>	P3	16	121.43871	-31.073431	9.061	11336
<i>Diocirea acutifolia</i>	P3	17	121.436628	-31.072814	1.866	916
<i>Diocirea acutifolia</i>	P3	18	121.438385	-31.076741	0.018	30
<i>Diocirea acutifolia</i>	P3	19	121.43892	-31.075684	2.363	5400
<i>Diocirea acutifolia</i>	P3	21	121.42322	-31.089386	3.683	4530
<i>Diocirea acutifolia</i>	P3	22	121.420616	-31.089416	0.317	250
<i>Diocirea acutifolia</i>	P3	23	121.419723	-31.088345	0.196	100
<i>Diocirea acutifolia</i>	P3	24	121.435512	-31.081167	0.973	150
<i>Diocirea acutifolia</i>	P3	26	121.436275	-31.079601	0.471	150
<i>Diocirea acutifolia</i>	P3	20	121.424491	-31.0862	0.005	10
<i>Diocirea acutifolia</i>	P3	25	121.435891	-31.080415	0.110	50
<i>Diocirea acutifolia</i>	P3	27	121.437127	-31.074634	0.010	100
<i>Diocirea acutifolia</i>	P3	28	121.435467	-31.074056	0.021	50

This species is both widespread and in large numbers throughout the local and regional area, and is well documented by previous flora surveys. Recorded locations range from Coolgardie, Norseman, Kambalda, Widgiemooltha and Madoonia Downs.

No yellow sand or granite outcrops were identified in the survey area, thus limiting the habitat and likelihood of the presence of Threatened Flora *Acacia sciophanes* and *Gastrolobium graniticum*.

At the time of the survey, (2013 onwards), publication of *Tetratheca spenceri* was available, with pictures of the plant and habitat included in *Nuytsia* 22 (3): 111–120. *Tetratheca* species are a uniquely identifiable perennial leafless Genus with tufted long terete stems (Caespitose). This genus usually requires flowering material to allow identification to a species level, however NVS' botanists are able to identify this taxon to a Genus level in the field. Although potentially similar habitat was available in the survey area (Vegetation codes b, g and t - in Section 3.2.2 below), this Genus was not recorded during any of the multiple field surveys.

The survey area completed in May 2012, prior to the discovery of *Tetratheca spenceri*, was revisited in 2015, to account for any possible habitat. This species was not recorded on the survey area.

3.2.2 Vegetation Type, Extent and Status

A total of 38 families, 84 genera and 198 species were recorded within the survey area. Thirty major vegetation groups were recorded in the survey area, and are considered to be in Good, Very Good, Excellent or Degraded condition (using the scale of Keighery 1994, see Appendix 3). No vegetation was considered in Pristine condition. Maps of the survey area can be seen in Appendix 4.

No unique or restricted vegetation communities were identified, and all vegetation types/communities are common, widespread and well represented in the Eastern Goldfields subregion.

The summary of vegetation groups contained within the survey area is summarised in Table 9 below. Maps of the survey area can be seen in Appendix 4.

Table 9: Vegetation Group Summary

Vegetation Group	Vegetation Code	Family	Genus	Species	Area (ha)	Percentage of Entire Survey Area (%)	Area within Project Tenements (ha)	Percentage composition of Project Tenements (%)
Transitional Eucalyptus Woodland over mixed shrubland	a	25	39	96	2619.72	41.41%	921.67	48.7%
Eucalyptus oleosa and Eucalyptus lesouefii over Melaleuca sheathiana and Cratystylis conocephala	aa	10	16	27	12.61	0.20%	6.66	0.35%
Eucalyptus oleosa over Eremophila interstans over sclerophyll shrubland	ab	9	13	18	2.48	0.04%	1.03	0.05%
Eucalyptus oleosa over Triodia scariosa	ac	15	22	30	7.83	0.12%	5.39	0.28%
Eucalyptus salubris woodland	ad	8	10	12	2.52	0.04%	2.50	0.13%
Mixed Eucalyptus woodland over sclerophyll shrubland on undulating hills	b	26	40	88	1502.26	23.75%	227.18	12%
Acacia acuminata shrubland	c	30	58	99	581.55	9.19%	74.91	3.96%
Open Eucalyptus salmonophloia woodland	d	11	16	25	335.77	5.31%	78.12	4.13%
Eucalyptus salmonophloia over Maireana sedifolia	e	7	10	17	261.04	4.13%	N/A	0%
Eucalyptus salmonophloia woodland over mixed shrubland	f	12	21	40	88.14	1.39%	7.91	0.42%
Eucalyptus lesouefii and E. gracilis on rocky hill slopes	g	15	17	23	78.32	1.24%	21.57	1.14%
Mixed Eucalyptus over Melaleuca sheathiana shrubland	h	13	20	44	249.64	3.95%	236.94	12.52%
Eucalyptus ravidia woodland	i	14	25	45	216.07	3.42%	15.84	0.84%
Eucalyptus stricklandii over Acacia and sclerophyll shrubland	j	14	17	26	29.57	0.47%	N/A	0%
Mixed Eucalyptus woodland over sclerophyll shrubland with Diocirea acutifolia on undulating hills	k	16	19	32	23.58	0.37%	15.90	0.84%
Melaleuca sheathiana shrubland with Eucalyptus oleosa over Cratystylis conocephala	l	9	15	23	22.72	0.36%	22.72	1.2%
Eucalyptus lesouefii woodland	m	8	12	24	39.06	0.62%	39.06	2.06%
Eucalyptus gracilis woodland	n	4	5	8	25.42	0.40%	9.77	0.52%
Eucalyptus stricklandii woodland over Tecticornia open shrubland	o	9	13	20	15.13	0.24%	N/A	0%
Eucalyptus transcontinentalis and E. campaspe over Melaleuca sheathiana shrubland	p	19	24	33	5.71	0.09%	5.71	0.3%
Casuarina pauper and Eucalyptus lesouefii over mixed shrubland over greenstone hills	q	13	16	22	5.38	0.09%	5.38	0.28%
Eucalyptus griffithsii woodland	r	20	26	55	37.34	0.59%	37.34	1.97%
Eucalyptus campaspe and E. gracilis woodland	s	9	13	16	14.38	0.23%	14.38	0.76%
Eucalyptus stricklandii and E. lesouefii over Beyeria sulcata	t	15	18	28	3.23	0.05%	3.23	0.17%
Transitional Eucalyptus Woodland over Diocirea acutifolia	u	20	33	74	11.15	0.18%	7.84	0.41%
Existing Disturbance	v	N/A	N/A	N/A	11.16	0.18%	11.16	0.59%
Acacia gibbosa shrubland over Prostanthera grylloana	w	11	18	25	12.37	0.20%	7.75	0.41%
Acacia quadrimarginea over Allocasuarina shrubland	x	13	14	17	2.99	0.05%	2.99	0.16%
Revegetation Shrubland	y	14	19	39	105.07	1.66%	105.07	5.55%
Eucalyptus oleosa and E. griffithsii woodland	z	12	19	25	4.40	0.07%	4.40	0.23%
Total		38*	84*	198*	6326.61*	100.00%#	2000*	100%#

Note: * Within total survey area (not sum of column)
Sum of column

The vegetation groups are described in more detail below.

3.2.2.1 Transitional *Eucalyptus* woodland over mixed shrubland (a)

This vegetation group consisted of 25 Families, 39 Genera and 96 Species. The vegetation group was approximately 2,619.72 ha which makes up 41.41% of the entire survey area and 48.7% of the Project Tenement area.

Dominant species were *Eucalyptus transcontinentalis*, *E. gracilis*, *E. salmonophloia*, *E. ravidia*, *Senna artemisioides* subsp. *artemisioides* and *Eremophila scoparia*.



Figure 4: Transitional *Eucalyptus* woodland over mixed shrubland within the survey area

3.2.2.2 *Eucalyptus oleosa* and *Eucalyptus lesouefii* over *Melaleuca sheathiana* and *Cratystylis conocephala* (aa)

This vegetation group consisted of 10 Families, 16 Genera and 27 Species. The vegetation group was approximately 12.61 ha which makes up 0.2% of the survey area and 0.35% of the Project Tenement area.

Dominant species were *Eucalyptus oleosa* subsp. *oleosa*, *Eucalyptus lesouefii*, *Melaleuca sheathiana* and *Cratystylis conocephala*.



Figure 5: *Eucalyptus oleosa* and *Eucalyptus lesouefii* over *Melaleuca sheathiana* and *Cratystylis conocephala* within the survey area

3.2.2.3 *Eucalyptus oleosa* over *Eremophila interstans* over sclerophyll shrubland (ab)

This vegetation group consisted of 9 Families, 13 Genera and 18 Species. The vegetation group was approximately 2.48 ha which makes up 0.04% of the survey area and 0.05% of the Project Tenement area.

Dominant species were *Eucalyptus oleosa* subsp. *oleosa*, *Eremophila interstans* subsp. *virgata*, *Grevillea acuaria*, *Scaevola spinescens* and *Olearia muelleri*.



Figure 6: *Eucalyptus oleosa* over *Eremophila interstans* over sclerophyll shrubland within the survey area

3.2.2.4 *Eucalyptus oleosa* over *Triodia scariosa* (ac)

This vegetation group consisted of 15 Families, 22 Genera and 30 Species. The vegetation group was approximately 7.83 ha which makes up 0.12% of the survey area and 0.28% of the Project Tenement area.

Dominant species were *Eucalyptus oleosa* subsp. *oleosa*, *Senna artemisioides* subsp. *filifolia*, *Westringia rigida*, *Acacia hemiteles*, *Olearia muelleri*, *Beyeria sulcata* var. *sulcata* and *Scaevola spinescens*.



Figure 7: *Eucalyptus oleosa* over *Triodia scariosa* within the survey area

3.2.2.5 *Eucalyptus salubris* woodland (ad)

This vegetation group consisted of 8 Families, 10 Genera and 12 Species. The vegetation group was approximately 2.52 ha which makes up 0.04% of the survey area and 0.13% of the Project Tenement area.

Dominant species were *Eucalyptus salubris*, *Eremophila* sp. Mt Jackson, *Halgania andromedifolia*, *Eremophila decipiens* subsp. *decipiens* and *Olearia muelleri*.



Figure 8: *Eucalyptus salubris* woodland within the survey area

3.2.2.6 Mixed *Eucalyptus* woodland over sclerophyll shrubland on undulating hills (b)

This vegetation group consisted of 26 Families, 40 Genera and 88 Species. The vegetation group was approximately 1,502.26 ha which makes up 23.75% of the survey area and 12.00% of the Project Tenement area.

Dominant species were *Eucalyptus transcontinentalis*, *E. lesouefii*, *E. gracilis*, *E. ravida*, *Melaleuca sheathiana*, *Acacia erinacea* and *Trymalium myrtillus*.



Figure 9: Mixed *Eucalyptus* woodland over sclerophyll shrubland within the survey area

3.2.2.7 *Acacia acuminata* shrubland with emergent *Eucalyptus griffithsii* (c)

This vegetation group consisted of 30 Families, 58 Genera and 99 Species. The vegetation group was approximately 581.55 ha which makes up 9.19% of the survey area and 3.96% of the Project Tenement area.

Dominant species were *Eucalyptus griffithsii*, *Acacia acuminata*, *Trymalium myrtillus*, *Scaevola spinescens*, and *Acacia erinacea*.



Figure 10: *Acacia acuminata* shrubland with emergent *Eucalyptus griffithsii* within the survey area

3.2.2.8 Open *Eucalyptus salmonophloia* woodland (d)

This vegetation group consisted of 11 Families, 16 Genera and 25 Species. The vegetation group was approximately 335.77 ha which makes up 5.31% of the survey area and 4.13% of the Project Tenement area.

Dominant species were *Eucalyptus salmonophloia*, *Senna artemisioides* subsp. *filifolia*, *Acacia hemiteles* and *Eremophila interstans* subsp. *virgata*.



Figure 11: Open *Eucalyptus salmonophloia* woodland within the survey area

3.2.2.9 *Eucalyptus salmonophloia* woodland over *Maireana sedifolia* shrubland (e)

This vegetation group consisted of 7 Families, 10 Genera and 17 Species. The vegetation group was approximately 261.04 ha which makes up 4.13% of the survey area and 0.00% of the Project Tenement area.

Dominant species were *Eucalyptus salmonophloia*, *Maireana sedifolia* and *Cratystylis conocephala*.



Figure 12: *Eucalyptus salmonophloia* woodland over *Maireana sedifolia* shrubland within the survey area

3.2.2.10 *Eucalyptus salmonophloia* woodland over mixed shrubland (f)

This vegetation group consisted of 12 Families, 21 Genera and 40 Species. The vegetation group was approximately 81.14 ha which makes up 1.39% of the survey area and 0.42% of the Project Tenement area.

Dominant species were *Eucalyptus salmonophloia* over *Eremophila scoparia*, *Senna artemisioides* subsp. *artemisioides*, and *Dodonaea lobulata*.



Figure 13: *Eucalyptus salmonophloia* woodland over mixed shrubland within the survey area

3.2.2.11 *Eucalyptus lesouefii* and *E. gracilis* woodland on rocky hill slopes (g)

This vegetation group consisted of 15 Families, 17 Genera and 23 Species. The vegetation group was approximately 78.32 ha which makes up 1.24% of the survey area and 1.14% of the Project Tenement area.

Dominant species were *Eucalyptus lesouefii*, *E. gracilis*, *Halgania andromedifolia*, and *Acacia erinacea*.



Figure 14: *Eucalyptus lesouefii* and *E. gracilis* woodland on rocky hill slopes within the survey area

3.2.2.12 Mixed *Eucalyptus* woodland over *Melaleuca sheathiana* shrubland (h)

This vegetation group consisted of 13 Families, 20 Genera and 44 Species. The vegetation group was approximately 249.64 ha which makes up 3.95% of the survey area and 12.52% of the Project Tenement area.

Dominant species were *Eucalyptus transcontinentalis*, *E. lesouefii*, *E. oleosa* subsp. *oleosa*, *E. salmonophloia*, *E. gracilis*, *Melaleuca sheathiana*, *Senna artemisioides* subsp. *artemisioides*, *Eremophila scoparia* and *Olearia muelleri*.



Figure 15: Mixed *Eucalyptus* woodland over *Melaleuca sheathiana* shrubland within the survey area

3.2.2.13 *Eucalyptus ravida* woodland (i)

This vegetation group consisted of 14 Families, 25 Genera and 45 Species. The vegetation group was approximately 216.07 ha which makes up 3.42% of the survey area and 0.84% of the Project Tenement area.

Dominant species were *Eucalyptus ravida*, *Tecticornia disarticulata* and *Atriplex codonocarpa*.



Figure 16: *Eucalyptus ravida* woodland within the survey area

3.2.2.14 *Eucalyptus stricklandii* over *Acacia* and sclerophyll shrubland (j)

This vegetation group consisted of 14 Families, 17 Genera and 26 Species. The vegetation group was approximately 29.57 ha which makes up 0.47% of the survey area and 0.00% of the Project Tenement area.

Dominant species were *Eucalyptus stricklandii*, *Dodonaea lobulata*, *Acacia assimilis* and *Scaevola spinescens*.



Figure 17: *Eucalyptus stricklandii* over *Acacia* and sclerophyll shrubland within the survey area

3.2.2.15 Mixed *Eucalyptus* woodland over sclerophyll shrubland with *Diocirea acutifolia* (P3) on undulating hills (k)

This vegetation group consisted of 16 Families, 19 Genera and 32 Species. The vegetation group was approximately 23.58 ha which makes up 0.37% of the survey area and 0.84% of the Project Tenement area.

Dominant species were *Eucalyptus transcontinentalis*, *E. gracilis*, *E. lesouefii*, *E. oleosa* subsp. *oleosa*, *E. salmonophloia*, *Eremophila decipiens* subsp. *decipiens* and *Diocirea acutifolia*



Figure 18: Mixed *Eucalyptus* woodland over sclerophyll shrubland with *Diocirea acutifolia* (P3) on undulating hills within the survey area

3.2.2.16 *Melaleuca sheathiana* shrubland with *Eucalyptus oleosa* over *Cratystylis conocephala* (I)

This vegetation group consisted of 9 Families, 15 Genera and 23 Species. The vegetation group was approximately 22.72 ha which makes up 0.36% of the survey area and 1.20% of the Project Tenement area.

Dominant species were *Eucalyptus oleosa*, and *Melaleuca sheathiana* and *Cratystylis conocephala*.



Figure 19: *Melaleuca sheathiana* shrubland with *Eucalyptus oleosa* over *Cratystylis conocephala* within the survey area

3.2.2.17 *Eucalyptus lesouefii* woodland (m)

This vegetation group consisted of 8 Families, 12 Genera and 24 Species. The vegetation group was approximately 39.06 ha which makes up 0.62% of the survey area and 2.06% of the Project Tenement area.

Dominant species were *Eucalyptus lesouefii*, *Senna artemisioides* subsp. *filifolia*.



Figure 20: *Eucalyptus lesouefii* shrubland within the survey area

3.2.2.18 *Eucalyptus gracilis* woodland (n)

This vegetation group consisted of 4 Families, 5 Genera and 8 Species. The vegetation group was approximately 25.42 ha which makes up 0.40% of the survey area and 0.52% of the Project Tenement area.

Dominant species were *Eucalyptus gracilis*, *Eremophila oldfieldii* subsp. *angustifolia*, *E. scoparia* and *Olearia muelleri*.



Figure 21: *Eucalyptus gracilis* woodland within the survey area

3.2.2.19 *Eucalyptus stricklandii* woodland over *Tecticornia* open shrubland (o)

This vegetation group consisted of 9 Families, 13 Genera and 20 Species. The vegetation group was approximately 15.13 ha which makes up 0.24% of the survey area and 0.00% of the Project Tenement area.

Dominant species were *Eucalyptus stricklandii*, *E. celastroides*, subsp. *celastroides* and *Tecticornia disarticulata*.



Figure 22: *Eucalyptus stricklandii* woodland over *Tecticornia* open shrubland within the survey area

3.2.2.20 *Eucalyptus transcontinentalis* and *E. campaspe* woodland over *Melaleuca sheathiana* shrubland (p)

This vegetation group consisted of 19 Families, 24 Genera and 33 Species. The vegetation group was approximately 5.71 ha which makes up 0.09% of the survey area and 0.30% of the Project Tenement area.

Dominant species were *Eucalyptus transcontinentalis*, *E. campaspe*, *Melaleuca sheathiana*, and *Eremophila clavata*.



Figure 23: *Eucalyptus transcontinentalis* and *E. campaspe* woodland over *Melaleuca sheathiana* shrubland within the survey area

3.2.2.21 *Casuarina pauper* shrubland with *Eucalyptus lesouefii* over mixed shrubland across greenstone hills (q)

This vegetation group consisted of 13 Families, 16 Genera and 22 Species. The vegetation group was approximately 5.38 ha which makes up 0.09% of the survey area and 0.28% of the Project Tenement area.

Dominant species were *Casuarina pauper*, *E. lesouefii*, *Eremophila interstans* subsp. *virgata*, and *Scaevola spinescens*.



Figure 24: *Casuarina pauper* shrubland with *Eucalyptus lesouefii* over mixed shrubland across greenstone hills within the survey area

3.2.2.22 *Eucalyptus griffithsii* woodland (r)

This vegetation group consisted of 20 Families, 26 Genera and 55 Species. The vegetation group was approximately 37.34 ha which makes up 0.59% of the survey area and 1.97% of the Project Tenement area.

Dominant species were *Eucalyptus griffithsii*, *Senna artemisioides* subsp. *filifolia*, *Eremophila interstans* subsp. *virgata* and *E. scoparia*.



Figure 25: *Eucalyptus griffithsii* woodland within the survey area

3.2.2.23 *Eucalyptus campaspe* and *E. gracilis* woodland (s)

This vegetation group consisted of 9 Families, 13 Genera and 16 Species. The vegetation group was approximately 14.38 ha which makes up 0.23% of the survey area and 0.76% of the Project Tenement area.

Dominant species were *Eucalyptus campaspe*, *Eucalyptus gracilis* and *Melaleuca sheathiana*.



Figure 26: *Eucalyptus campaspe* and *E. gracilis* woodland within the survey area

3.2.2.24 *Eucalyptus stricklandii* and *E. lesouefii* woodland over *Beyeria sulcata* (t)

This vegetation group consisted of 15 Families, 18 Genera and 28 Species. The vegetation group was approximately 3.23 ha which makes up 0.05% of the survey area and 0.17% of the Project Tenement area.

Dominant species were *Eucalyptus stricklandii*, *E. lesouefii*, *Beyeria sulcata* var. *sulcata*.



Figure 27: *Eucalyptus stricklandii* and *E. lesouefii* woodland over *Beyeria sulcata* within the survey area

3.2.2.25 Transitional *Eucalyptus* woodland over *Diocirea acutifolia* (u)

This vegetation group consisted of 20 Families, 33 Genera and 74 Species. The vegetation group was approximately 11.15 ha which makes up 0.18% of the survey area and 0.41% of the Project Tenement area.

Dominant species were *Eucalyptus transcontinentalis*, *E. gracilis*, *E. salmonophloia*, *E. ravida*, *Senna artemisioides* subsp. *artemisioides*, and *Diocirea acutifolia*.



Figure 28: Transitional *Eucalyptus* woodland over *Diocirea acutifolia*

3.2.2.26 Existing Disturbance Area (v)

This area consisted of existing pits and waste landforms. The area was approximately 11.16 ha which makes up 0.18% of the survey area and 0.59% of the Project Tenement area.



Figure 29: Existing Disturbance within the survey area

3.2.2.27 *Acacia gibbosa* shrubland over *Prostanthera grylloana* (w)

This vegetation group consisted of 11 Families, 18 Genera and 25 Species. The vegetation group was approximately 12.37 ha which makes up 0.2% of the survey area and 0.41% of the Project Tenement area.

Dominant species were *Acacia gibbosa*, *Melaleuca hamata*, *Lomandra effusa*, and *Prostanthera grylloana*.



Figure 30: *Acacia gibbosa* shrubland over *Prostanthera grylloana* within the survey area

3.2.2.28 *Acacia quadrimarginea* over *Allocasuarina* shrubland (x)

This vegetation group consisted of 13 Families, 14 Genera and 17 Species. The vegetation group was approximately 2.99 ha which makes up 0.05% of the survey area and 0.16% of the Project Tenement area.

Dominant species were *Acacia quadrimarginea*, *Allocasuarina campestris*, *Allocasuarina helmsii*, *Acacia acuminata*, *Trymalium myrtillus* subsp. *myrtillus* and *Scaevola spinescens*.



Figure 31: *Acacia quadrimarginea* over *Allocasuarina* shrubland within the survey area

3.2.2.29 Revegetation Shrubland (y)

This vegetation group consisted of 14 Families, 19 Genera and 39 Species. The vegetation group was approximately 105.07 ha which makes up 1.66% of the survey area and 5.55% of the Project Tenement area.

Dominant species were *Dodonaea lobulata*, *Radyera farragei*, *Alyogyne hakeifolia*, *Allocasuarina campestris*, *Maireana tomentosa*, *Maireana trichoptera*, *Sclerolaena diacantha* and *Acacia erinacea*.



Figure 32: Revegetation Shrubland within the survey area

3.2.2.30 *Eucalyptus oleosa* and *E. griffithsii* woodland (z)

This vegetation group consisted of 12 Families, 19 Genera and 25 Species. The vegetation group was approximately 4.40 ha which makes up 0.07% of the survey area and 0.25% of the Project Tenement area.

Dominant species were *Eucalyptus oleosa* subsp. *oleosa*, *E. griffithsii*, *Senna artemisioides* subsp. *filifolia*, *Prostanthera campbellii*, *Grevillea acuaria*, *Triodia rigidissima* and *Acacia ligulata*.



Figure 33: *Eucalyptus oleosa* and *E. griffithsii* woodland within the survey area

3.2.3 Weeds

The EPBC search results revealed suitable habitat for one weed species *Carrichtera annua* (Ward's Weed) was likely to occur within the survey area, however this species was not recorded within the survey area.

Three other weed species, *Sonchus oleraceus* (Common Sowthistle), *Lysimachia arvensis* (Pimpernel) and *Centaurea melitensis* (Maltese Cockspur) were recorded in the area.

S. oleraceus is widespread along roadsides, in gardens and wasteland throughout WA and is native to Eurasia and North Africa (Hussey *et al*, 2007).

L. arvensis, is an occasional weed of horticulture, crops and pastures, and a wide spread weed of gardens, paddocks, granite rocks and disturbed bushland throughout the south-west. It is native to Europe (Hussey *et al*, 2007).

C. melitensis is native to the Mediterranean region of Europe and Africa, and is widespread throughout horticulture roadsides, crops and pastures in Western Australia (Hussey *et al*, 2007).

These species are not listed as declared plants by DPIRD (2019).

3.2.4 Vegetation Condition

Evidence of grazing, as well as historic mining and exploration was observed during the field assessment.

Overall, the condition of the vegetation was determined to be "Excellent", "Very Good" or "Good" with areas which were affected by grazing and historic exploration in either "Good" or "Degraded" condition.

A map of the vegetation condition is included in Appendix 4.

3.2.5 Assessment for the Clearing Principles

The Department of Water and Environment Regulation (DWER) assesses clearing permits against ten principles relating to the effect of clearing. NVS submits the following comments regarding the Clearing principles;

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Vegetation communities are predominately eucalypt woodlands over mixed shrublands on broad loamy plains and low rises. While 198 flora taxa representing 38 families and 84 genera were found during field survey, the vegetation is typical of the region and surrounding regions and not considered to be unusually diverse.

Priority species *Diocirea acutifolia* (P3) was recorded within the survey area. A total of 69,686 plants have been estimated to occur within these populations.

Clearing of this species within the survey area is not likely to upgrade or increase its Conservation rating, as this species is both widespread and in large numbers throughout the local and regional area and is well documented by previous flora surveys. Recorded locations range from Coolgardie, Norseman, Kambalda, Widgiemooltha and Madoonia Downs, with known DBCA records located between 12km and 112km from the survey area.

Floristically this project is not likely to be at variance to this Principle.

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

This was not assessed in this report.

(c) Native vegetation should not be cleared if it includes, or is necessary for, the continued existence of rare flora.

No DRF or Threatened Flora were located within the survey area.

Priority species *Diocirea acutifolia* (P3) was recorded within the survey area. A total of 69,686 plants have been estimated to occur within these populations.

Clearing of this species within the survey area is not likely to upgrade or increase its Conservation rating, as this species is both widespread and in large numbers throughout the local and regional area and is well documented by previous flora surveys. Recorded locations range from Coolgardie, Norseman, Kambalda, Widgiemooltha and Madoonia Downs, with known DBCA records located between 12km and 112km from the survey area.

The Project is not at variance to this Principle.

(d) Native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of a threatened ecological community.

There are no known Threatened or Priority Ecological communities recorded in the survey area, and no vegetation groups recorded in the survey area are regarded as such.

The Project is not at variance to this Principle.

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

As demonstrated in section 3.1.4, the Beard vegetation associations which occur within the survey area are considered to have between 70-100% of their spatial area remaining post European settlement and are not adversely affected by extensive clearing such as farming.

The Project is not at variance to this Principle.

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

The survey area contains no wetlands or watercourses, as identified by DWER Clearing Permit System Map Viewer (DWER, 2019).

There are no permanent watercourses or wetlands within the area proposed to be cleared.

Some ephemeral drainage lines pass through the application area. Drainage lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall. Vegetation growing around drainage lines are not confined to these areas and are not growing exclusively in association with drainage lines. Potential impacts to vegetation growing in association with the watercourse may be minimised by the implementation of a watercourse management condition.

The Project may be at variance to this Principle.

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

This was not assessed in this report

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

No conservation areas will be affected by clearing within the survey area. The closest DBCA Managed land is the "Class C" Yallari Timber Reserve located approximately 2.3km southwest of the survey area (DWER, 2019). This Timber Reserve is vested with the Conservation Commission for the purpose of Timber Production, however, is considered by DBCA as an area for the conservation of flora and fauna.

The proposed clearing is not likely to be at variance to this Principle

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

This was not assessed in this report

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

This was not assessed in this report

4. DISCUSSION

The field assessment established that the condition of the vegetation in the survey area is overall "Very Good", with some areas "Excellent" and other areas affected by exploration in "Good" or "Degraded" condition. No areas of vegetation were assessed to be in "Pristine" condition.

No DRF, TECs or PECs were recorded in the survey area.

One confirmed Priority Flora species *Diocirea acutifolia* (P3) was recorded at 28 locations within the survey area. Clearing of this species within the survey area is not likely to upgrade or increase its Conservation rating, as this species is both widespread and in large numbers throughout the local and regional area and is well documented by previous flora surveys. Recorded locations range from Coolgardie, Norseman, Kambalda, Widgiemooltha and Madoonia Downs, with known DBCA records located between 12km and 112km from the survey area.

Any proposed disturbance/clearing of vegetation will result in a loss of species from the proposed Mt Marion project area. However, given the extent of the Beard (1990) vegetation associations elsewhere, the impact on the vegetation and its component flora will not affect the conservation values of either, or create fragmentation or patches of remnant vegetation.

The following recommendations arise from the reconnaissance flora survey:

- Where possible, avoid areas of confirmed Priority Flora, or alter the disturbance footprint so that these populations are minimally affected; and
- Weed control measures should be implemented.

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6. GLOSSARY

Acronyms:

BOM	Bureau of Meteorology, Australian Government
BSc	Bachelor of Science
CALM	Department of Conservation and Land Management (now DBCA)
COO	Coolgardie Bioregion (IBRA)
COO03	Eastern Goldfields Subregion (IBRA)
CPS	Clearing Permit System (DWER)
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia
DOTEE	Department of the Environment and Energy, Australian Government
DPAW	Department of Parks and Wildlife, Western Australia (now DBCA)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DRF	Declared Rare Flora (now classed as Threatened Flora)
DWER	Department of Water and Environmental Regulation, Western Australia
EPA	Environmental Protection Authority, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth Act)
ESA	Environmentally Sensitive Area
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia, DOTEE
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
km	Kilometres
m	Metres
NVS	Native Vegetation Solutions
PEC	Priority Ecological Community, Western Australia
Ramsar	A wetland site designated of international importance under the Ramsar Convention (UNESCO)
TEC	Threatened Ecological Community
UNESCO	United Nations Educational, Scientific and Cultural Organization
WA	Western Australia
WAHERB	Western Australian Herbarium (DBCA)

Definitions:

{DBCA (2019) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia, January 2019}: -

T Threatened species:

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR Critically endangered species

Threatened species considered to be “*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN Endangered species

Threatened species considered to be “*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU Vulnerable species

Threatened species considered to be “*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct species:

Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.

EX Extinct species

Species where “*there is no reasonable doubt that the last member of the species has died*”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that “is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P Priority Species

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

Priority 1: Poorly-known species

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

Priority 2: Poorly-known species

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

Priority 3: Poorly-known species

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

Priority 4: Rare, Near Threatened and other species in need of monitoring

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Appendix 1

Relevant Government Database Search Results



EPBC Act Protected Matters Report

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

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

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 18/06/19 15:33:07

[Summary](#)

[Details](#)

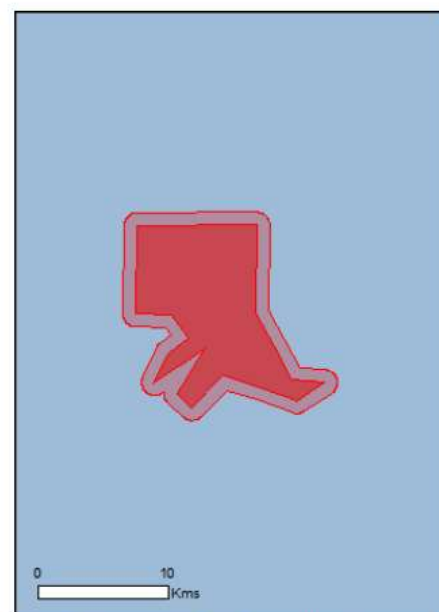
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

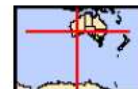
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Buffer: 1.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	5
Listed Migratory Species:	6

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	10
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	11
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area
Plants		
Gastrolobium graniticum Granite Poison [14872]	Endangered	Species or species habitat likely to occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]

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

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Yallari Timber Reserve	WA

Invasive Species [Resource Information]

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

Name	Status	Type of Presence
Birds		
Columba livia		
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Streptopelia senegalensis		
Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris		
Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus		
Goat [2]		Species or species habitat likely to occur within area
Equus asinus		
Donkey, Ass [4]		Species or species habitat likely to occur within area
Equus caballus		
Horse [5]		Species or species habitat likely to occur within area
Felis catus		
Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus		
House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus		
Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes		
Red Fox, Fox [18]		Species or species
Name	Status	Type of Presence
		habitat likely to occur within area
Plants		
Carrichtera annua		
Ward's Weed [9511]		Species or species habitat likely to occur within area

Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-31.0174 121.3906,-31.0698 121.3895,-31.0702 121.4145,-31.084 121.4264,-31.0932 121.412,-31.1104 121.4027,-31.0905 121.437,-31.117 121.4179,-31.1252 121.4285,-31.1062 121.4499,-31.1135 121.4765,-31.1211 121.5013,-31.1106 121.5204,-31.1089 121.498,-31.0698 121.4728,-31.0172 121.4735,-31.0174 121.3906

Acknowledgements

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

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

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

Please feel free to provide feedback via the [Contact Us](#) page.

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Appendix 2

Threatened Flora Databases Search Results (Information Sourced from DBCA, 2015a)

Taxon	Threatened Flora Status	Distribution	Flowering Period
<i>Acacia coatesii</i>	1	Coolgardie	
<i>Acacia crenulata</i>	3	Southern Cross, Carrabin, Bullabulling, Walyahmoning Rock, Chiddarcooping, Sandford Rocks N.R., Marvel Loch	Sep-Oct
<i>Acacia sciophanes</i>	T	Mukinbudin, Victoria Rock	Sep-Jan
<i>Acacia websteri</i>	1	Bencubbin, Coolgardie	-
<i>Austrostita blackii</i>	3	Merredin, Dalwallinu, Jaurdi, Widgiemooltha, eastern States, Tutanning Nature Reserve, Beverley, Blue Hills Range, Yandanoo Hills, Mt Manning Range, Barcooting Hill	
<i>Baeckea</i> sp. Gnarlbine Rocks (G. Barrett GRH469)	1	Gnarlbine Rocks, Coolgardie	Oct
<i>Baeckea</i> sp. Wialki (G.M. Storr s.n. 4/10/1958)	1	Wialki, Bonnie Rock, Diemals	Oct-Nov
<i>Banksia lullfitzii</i>	3	Southern Cross, Frank Hann N.P., Coolgardie, Mt Manning Range, Ravensthorpe	Mar-May
<i>Bossiaea concinna</i>	3	Cunderdin, Woolgangie, Coolgardie, Lake Mason Stn, Jerramungup, Pithara	Sep-Oct
<i>Bossiaea laxa</i>	2	Widgiemooltha	May
<i>Calandrinia kalanniensis</i>	2	Kalannie, Petrudor Rock, Xantippe Rock, Karara Station, Bonnie Rock, Yanneymooning NR, Hughden Rock	Dec-Jan
<i>Cryptandra crispula</i>	3	Lake Lefroy, Bullabulling, Karonie, Fraser Range	Jul-Sep
<i>Cyathostemon divaricatus</i>	1	Red Hill, Kambalda	Aug
<i>Cyathostemon verrucosus</i>	3	Bungabin Hill, Helena & Aurora Ranges, Queen Victoria Rocks, Kalgoorlie, Boorabbin	Sep-Dec, Mar
<i>Dampiera plumosa</i>	1	Sandstone, Coolgardie, Lake Barlee	Oct
<i>Diocirea acutifolia</i>	3	Coolgardie, Kambala, Widgiemooltha	Nov-Dec
<i>Diocirea microphylla</i>	3	Bullabulling, Gibraltar, Maggie Hays Hill, Lake Johnston	Dec
<i>Eremophila arachnoides</i> subsp. <i>tenera</i>	1	Kambalda, Laverton	Sep, Dec
<i>Eremophila veronica</i>	3	Queen Victoria Rock, Coolgardie	Oct-Nov
<i>Eucalyptus pterocarpa</i>	4	Norseman, Bronzite Ridge, Victoria Rock	Sep-Nov
<i>Eucalyptus websteriana</i> subsp. <i>norsemanica</i>	1	Norseman, Coolgardie	-
<i>Eucalyptus x brachyphylla</i>	4	Lake Lefroy, Karonie, Widgiemooltha	-
<i>Gastrolobium graniticum</i>	T	Coolgardie, Gnamma Hill, Narembreen, Yellowdine, Bullabulling	Aug-Nov
<i>Goodenia corralina</i>	2	Widgiemooltha	May
<i>Grevillea phillipsiana</i>	1	Norseman, Yardina, Kambalda, Widgiemooltha	Aug-Sep
<i>Hibbertia pachyphylla</i>	3	Frank Hann NP, Forrestania, Victoria Rocks	Sep-Nov
<i>Leucopogon remotus</i>	1	N of Bonnie Hill	Sep-Oct
<i>Leucopogon</i> sp. Bonnie Hill (K.R. Newbey 9831)	1	Bonnie Hill, South of Peak Charles	May, Jun
<i>Leucopogon</i> sp. Kambalda (J. Williams s.n. PERTH 07305028)	3	Kambalda	Jan
<i>Leucopogon</i> sp. Yanneymooning (F. Mollemans 3797)	3	Mukinbudin, Mt Jackson Stn., Bonnie Rock	May
<i>Melaleuca coccinea</i>	3	Karonie, Boulder, Widgiemooltha, Erayinia Hill, Norseman, Ravensthorpe	Oct-Nov
<i>Melaleuca macronychia</i> subsp. <i>trygonoides</i>	3	Lake View Rock, McDermid Rock, Queen Victoria Rock, Cave Hill	Feb, Jul, Aug
<i>Melichrus</i> sp. Coolgardie (K.R. Newbey 8698)	1	Coolgardie	
<i>Mirbelia densiflora</i>	3	Frank Hann NP, Kumari, Hatter Hill, Peak Charles, Forrestania, Mt Gibbs, Victoria Rock	Jan
<i>Persoonia leucopogon</i>	1	Between Coolgardie & Laverton, Comet Vale (Menzies)	-
<i>Phebalium drummondii</i>	3	Dowerin, Bonnie Rock, Wialki, Koorda-Mollerin, Manmanning, Hyden, Lake Grace	Oct-Nov
<i>Philothea apiculata</i>	2	Norseman, Mt Kirk, Widgiemooltha, Holleaton	Aug-Sep
<i>Phlegmatospermum eremaeum</i>	3	Coolgardie, Norseman, Cocklebidy, Forrest, Bruce Rock, Helena and Aurora Range, Caiguna	Aug-Oct
<i>Pityrodia scabra</i> subsp. <i>dendrotricha</i>	3	Forrestania, Marvel Loch, Jilbadji, Norseman, Southern Cross (Barker Lake), Widgiemooltha	Oct, Nov
<i>Prostanthera splendens</i>	1	Widgiemooltha, Higginsville, Cascade	Aug-Oct
<i>Psammomoya ephedroides</i>	3	Toolonga N.R., Kalbarri, Woolgorong, Mount Gibson, Coolgardie, Albany	

Taxon	Threatened Flora Status	Distribution	Flowering Period
<i>Ptilotus rigidus</i>	1	Widgiemooltha, Lake Lefroy	
<i>Stylidium choreanthum</i>	3	Helena & Aurora Range, Ghooli, Southern Cross, Kambalda, Koolyanobbing, Jaurdi Station, Ennuin Stn	Sep-Oct
<i>Styphelia</i> sp. Bullfinch (M. Hislop 3574)	3	Jackson Range, Bullfinch, Koolyanobbing, Bullabulling, Diemals Stn.	Apr-May
<i>Tecticornia flabelliformis</i>	1	Lake Yindarlgooda, Lake Deborah, Widgiemooltha, Eastern States	
<i>Tetratheca spenceri</i>	T	Kambalda West	Nov- Feb
<i>Thryptomene</i> sp. Londonderry (R.H. Kuchel 1763)	1	Coolgardie, Kambalda	
<i>Verticordia stenopetala</i>	3	Mt Holland, Moorine Rock, Queen Victoria Rock, Marvel Loch, Carrabin, Mt Walton, Holleaton	Oct

The GIS database results (DBCA, 2015a) revealed the following additional species to those listed above:

Taxon	Threatened Flora Status
<i>Acacia kerryana</i>	2
<i>Acacia sclerophylla</i> var. <i>teretiuscula</i>	1
<i>Allocasuarina eriochlamys</i> subsp. <i>grossa</i>	3
<i>Alyxia tetanifolia</i>	3
<i>Austroripia</i> sp. Carlingup Road (S. Kern & R. Jasper LCH 18459)	1
<i>Austroripia</i> sp. Dowerin (G. Wiehl F 8004)	2
<i>Baeckea</i> sp. Bulla Bulling (D.J.E. Whibley 4648)	1
<i>Elachanthus pusillus</i>	2
<i>Eremophila caerulea</i> subsp. <i>merrallii</i>	4
<i>Eremophila praecox</i>	1
<i>Eucalyptus jutsonii</i> subsp. <i>jutsonii</i>	4
<i>Frankenia glomerata</i>	3
<i>Gnephosis intonsa</i>	3
<i>Grevillea georgeana</i>	3
<i>Hakea rigida</i>	2
<i>Lepidium fasciculatum</i>	3
<i>Lepidium merrallii</i>	2
<i>Lepidosperma</i> sp. Parker Range (N. Gibson & M. Lyons 2094)	1
<i>Phebalium appressum</i>	1
<i>Phebalium clavatum</i>	2
<i>Ptilotus procumbens</i>	1
<i>Xanthoparmelia xanthomelanoides</i>	2

Appendix 3

Vegetation Condition Scale (Keighery, 1994)

Pristine (1). Pristine or nearly so, no obvious signs of disturbance.

Excellent (2). Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.

Very Good (3). Vegetation structure altered, obvious signs of disturbance.
For example, disturbance to vegetation structure caused by repeating fires, the presence of some more aggressive weeds, dieback, logging and grazing.

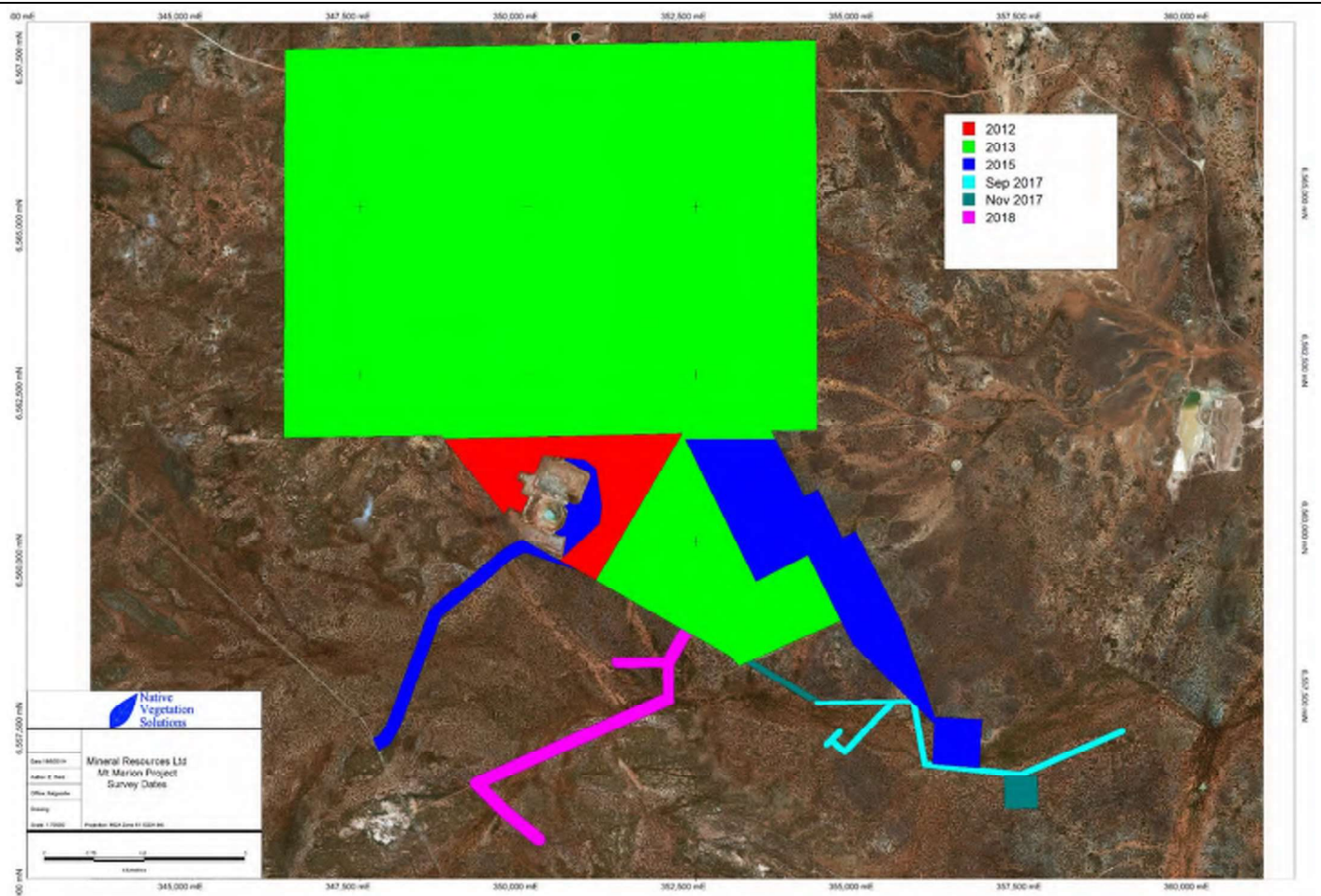
Good (4). Vegetation structure significantly altered by very obvious signs of multiple disturbance.
Retains basic vegetation structure or ability to regenerate it.
For example, disturbance to vegetation structure caused by frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.

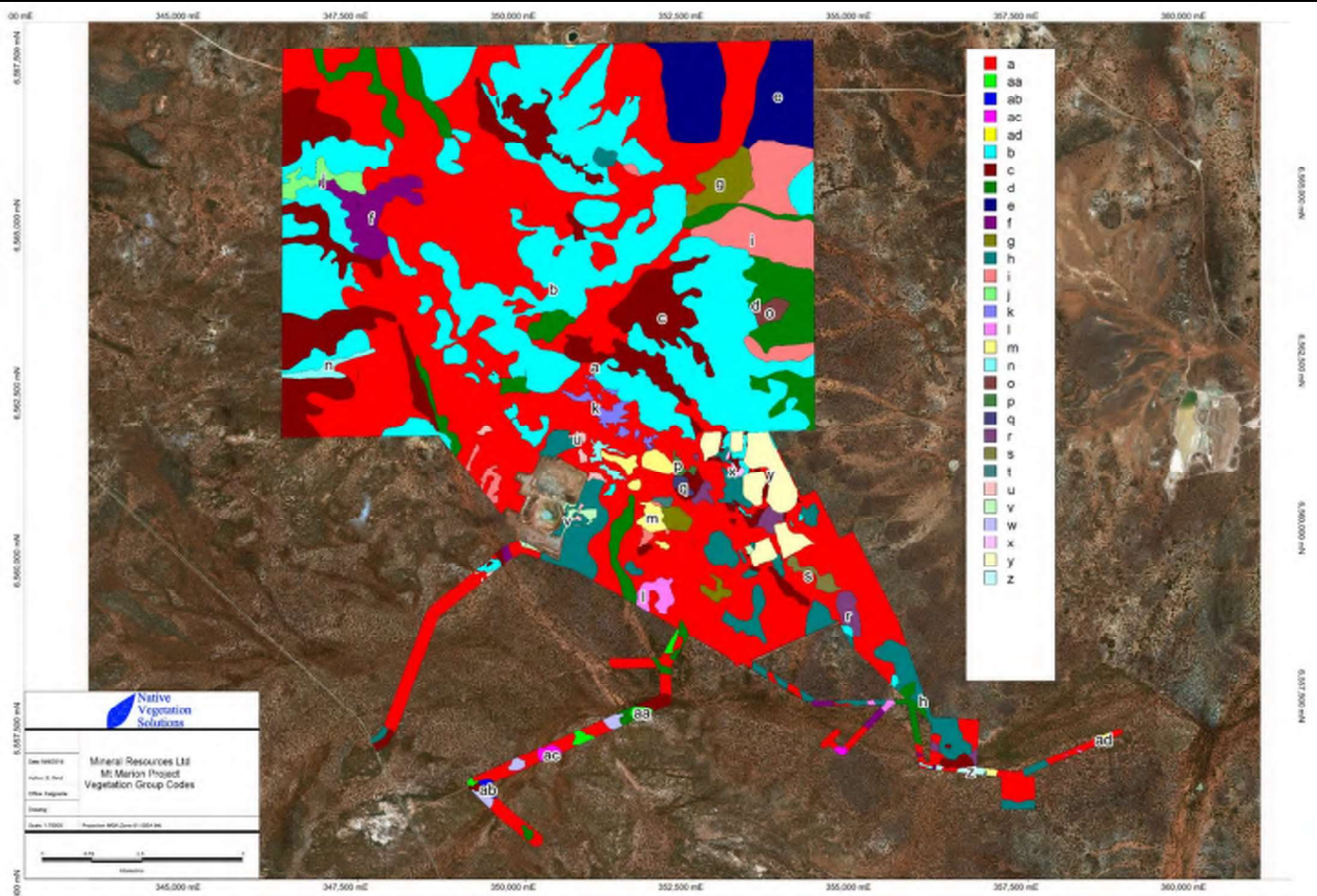
Degraded (5). Basic vegetation structure severely impacted by disturbance.
Scope for regeneration but not to a state approaching good condition without intensive management.
For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.

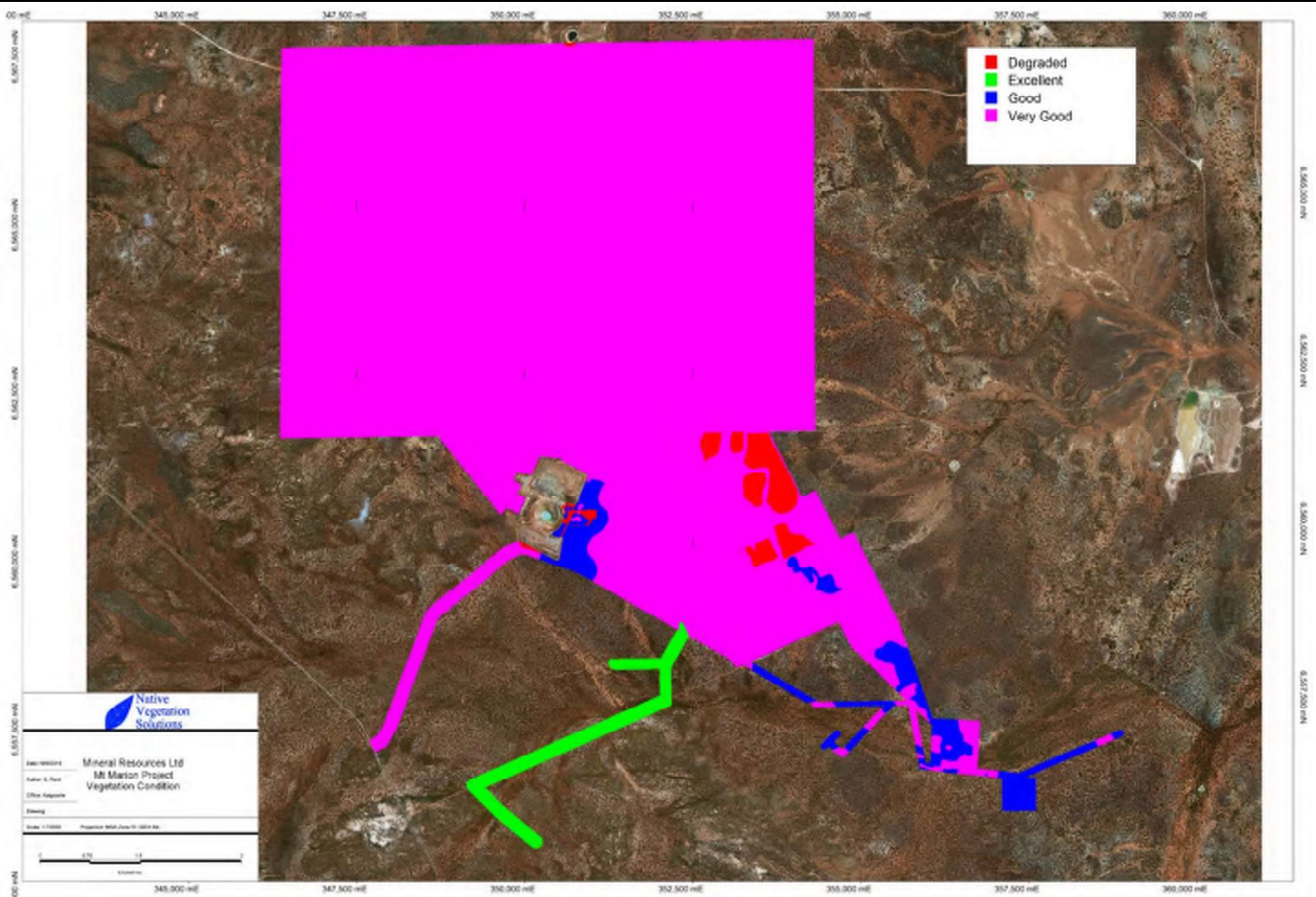
Completely Degraded (6). The structure of the vegetation is no longer intact and the area is completely or almost completely without native species.
These areas are often described as 'parkland cleared' with the flora compromising weed or crop species with isolated trees or shrubs.

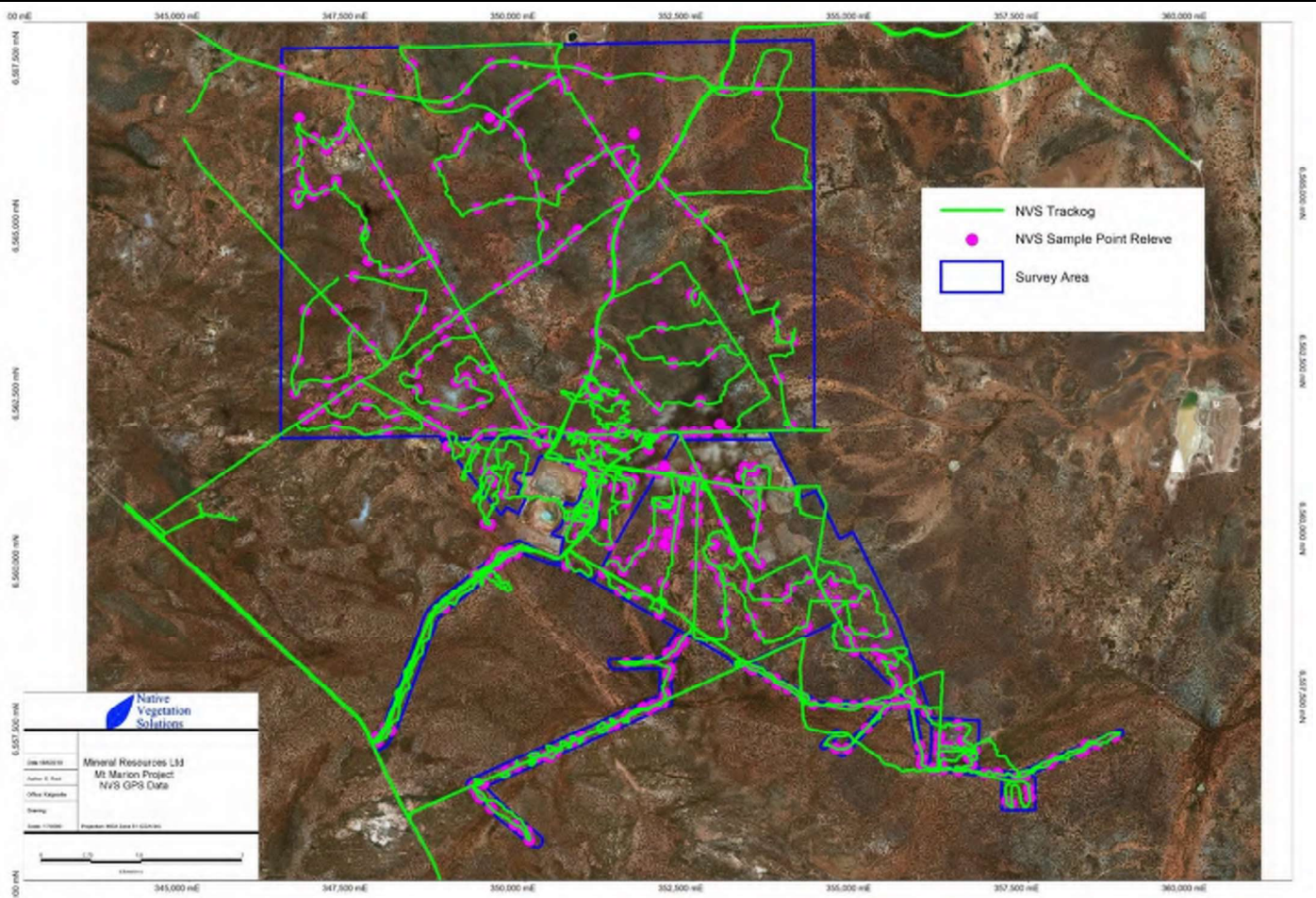
Appendix 4

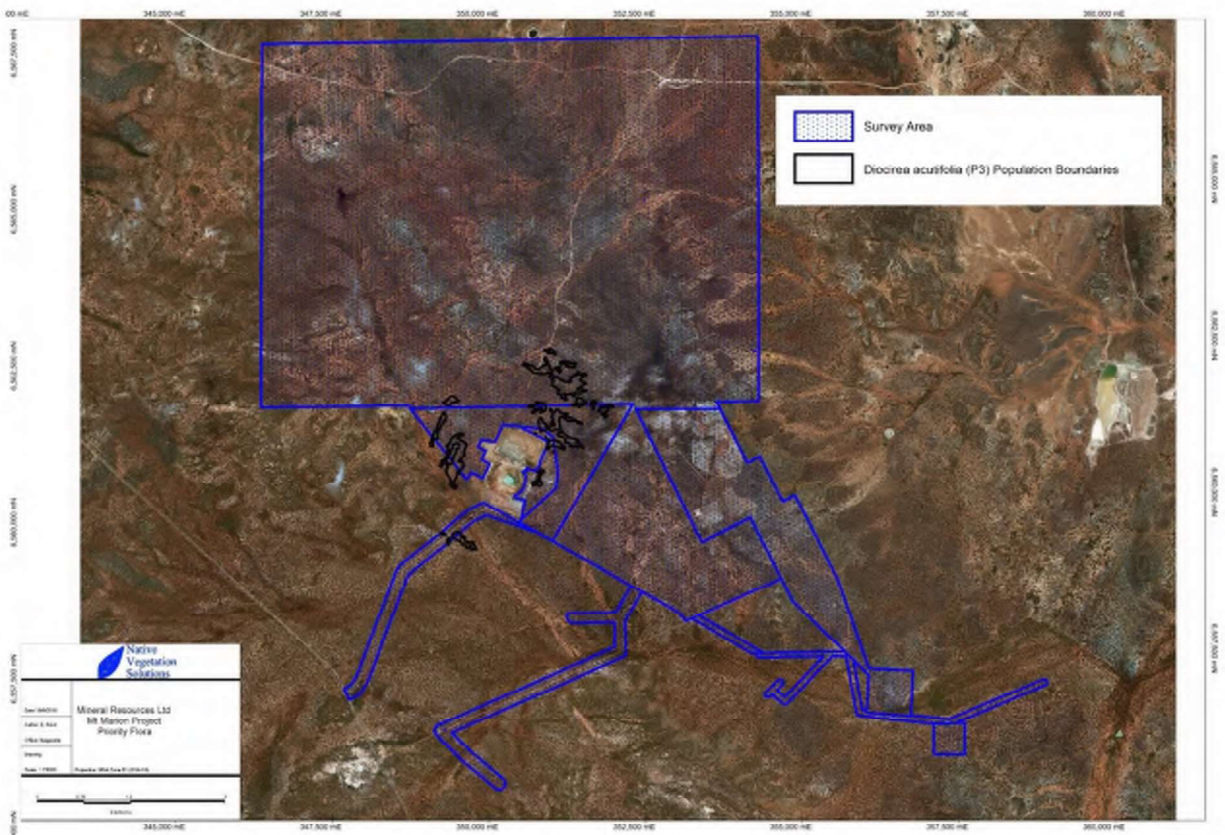
Vegetation Mapping











Appendix 5

Species List

Family	Genus	Species	Conservation Status	Annual, Perennial or Non-Native	a	aa	ab	ac	ad	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
Asteraceae	Tetragonia	eremaea		A	*																													
Amaranthaceae	Ptilotus	ovoides		A	*																													
Amaranthaceae	Ptilotus	nobilis subsp. nobilis		A	*																													
Amaranthaceae	Ptilotus	obovatus		P	*																													
Amaranthaceae	Ptilotus	polystachyus		A	*																													
Asteraceae	Ptilotus	raei		A	*																													
Apocynaceae	Alsea	buxifolia		P	*																													
Apocynaceae	Marsdenia	australis		P	*																													
Araliaceae	Trachymene	arata		A	*																													
Asparagaceae	Lomandra	effusa		P																														
Asparagaceae	Thysanotus	monglesianus		P	*																													
Asteraceae	Astragalus	virgatus		A	*																													
Asteraceae	Argemone	tomentosa		A	*																													
Asteraceae	Chrysanthemum	putale		P																														
Asteraceae	Chthonocarpus	pseudox		A	*																													
Asteraceae	Cratystylis	canadensis		P	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Asteraceae	Cratystylis	microphylla		P	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Asteraceae	Cratystylis	subulnensis		P	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Asteraceae	Olearia	muelleri		P	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Asteraceae	Olearia	pinetoides		P	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Asteraceae	Oreocaulum	cassiope		P	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Asteraceae	Podopsis	capillaris		A	*																													
Asteraceae	Rhodanthe	laevis		A	*																													
Asteraceae	Rhodanthe	oppositifolia subsp. oppositifolia		A	*																													
Asteraceae	Sarcocolla	oleaceus		NN																														
Asteraceae	Waltia	acuminata var. acuminata		A	*																													
Brassicaceae	Hesperis	andromedifolia		A	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Brassicaceae	Stenopetalum	filiforme		A	*																													
Campanulaceae	Isotria	petraea		A	*																													
Casuarinaceae	Allocasuarina	acutivalvis subsp. acutivalvis		P	*																													
Casuarinaceae	Allocasuarina	campestris		P	*																													
Casuarinaceae	Allocasuarina	helmsii		P	*																													
Casuarinaceae	Casuarina	pauper		P	*																													
Chenopodiaceae	Atriplex	bamburiana		P	*																													
Chenopodiaceae	Atriplex	canadensis		A	*																													
Chenopodiaceae	Atriplex	nummularia subsp. spatulata		P	*																													
Chenopodiaceae	Atriplex	versicolor		P	*																													
Chenopodiaceae	Chenopodium	gaudichaudianum		P	*																													
Chenopodiaceae	Dissocarpus	paradoxus		P	*																													
Chenopodiaceae	Encyrtaria	tomentosa		P	*																													
Chenopodiaceae	Encyrtaria	scleroloboides		P	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Chenopodiaceae	Maireana	brevifolia		P	*																													
Chenopodiaceae	Maireana	cuneata		P	*																													
Chenopodiaceae	Maireana	georgii		P	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Chenopodiaceae	Maireana	pentstemonifolia		P	*																													
Chenopodiaceae	Maireana	pyramidalis		P	*																													
Chenopodiaceae	Maireana	seafolia		P	*																													
Chenopodiaceae	Maireana	theriacalis		P	*																													
Chenopodiaceae	Maireana	tomentosa		P	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Chenopodiaceae	Maireana	trichoptera		P	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Chenopodiaceae	Maireana	triplex		P	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Chenopodiaceae	Rhaphis	dumetorum		P	*																													
Chenopodiaceae	Sclerolobium	cuneata		P	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Chenopodiaceae	Sclerolobium	densiflorum		P	*																													
Chenopodiaceae	Sclerolobium	diacantha		P	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Chenopodiaceae	Sclerolobium	potentillifolium		P	*																													
Chenopodiaceae	Tectaria	dissecta		P	*																													
Cyperaceae	Lepidosperma	sp. aff. fimbriatum		P	*																													
Ericaceae	Leucopogon	sp. Clyde Hill		P	*																													
Euphorbiaceae	Beyeria	sulcata var. sulcata		P	*																													
Fabaceae	Acacia	acanthoclada		P	*																													
Fabaceae	Acacia	andrewsii		P	*																													
Fabaceae	Acacia	apartensis		P	*																													
Fabaceae	Acacia	aristata		P	*																													
Fabaceae	Acacia	camptoclada		P	*																													
Fabaceae	Acacia	diversifolia		P	*																													
Fabaceae	Acacia	enervia subsp. enervia		P	*																													

Family	Genus	Species	Conservation Status	Annual, Perennial or Non-Native	a	aa	ab	ac	ad	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
Fabaceae	Acacia	erinnacea		P	*	*				*	*		*	*	*	*	*		*					*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Acacia	gibbosa		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Acacia	hemibates		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Acacia	jennense		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Acacia	kalbarriensis		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Acacia	ligulata		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Acacia	maritima		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Acacia	pachypoda		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Acacia	pinifolia		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Acacia	quadrangulata		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Acacia	rendlei		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Acacia	reticulata		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Acacia	silvica		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Acacia	tetragonophylla		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Dillwynia	sp. Coolgardie		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Mitella	depressa		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Mitella	quadrata		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Senna	artemisioides subsp. artemisioides		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Senna	artemisioides subsp. filifolia		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Senna	cardiosperma		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Swainsona	canescens		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fabaceae	Swainsona	platystylis		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Frankeniaceae	Frankenia	pauciflora var. pauciflora		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Frankeniaceae	Frankenia	setosa		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Goodeniaceae	Brunonia	australis		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Goodeniaceae	Dampiera	latifolia		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Goodeniaceae	Goodenia	benzoides		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Goodeniaceae	Goodenia	concinna		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Goodeniaceae	Scaevola	spinescens		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Haloragaceae	Haloragis	trigonocarpa		A	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Hemerocallidaceae	Dianella	revoluta var. divaricata		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lamiaceae	Prostanthera	albiflora subsp. albiflora		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lamiaceae	Prostanthera	campbellii		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lamiaceae	Prostanthera	gryllaria		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lamiaceae	Westringia	cephalantha subsp. cephalantha		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lamiaceae	Westringia	rigida		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Loganiaceae	Phyllanthum	salicifolium		A	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Malvaceae	Abutilon	cunninghamii		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Malvaceae	Alyogyne	hastifolia		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Malvaceae	Brachychiton	gregorii		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Malvaceae	Radyera	farraei		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Callistemon	glauco		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	campanae		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	calostroides subsp. calostroides		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	concinna		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	flocktoniae subsp. flocktoniae		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	gracilis		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	griffithii		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	lesouefii		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	longicornis		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	loagophloe subsp. fissophloe		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	oleosa subsp. oleosa		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	ovata		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	salmonophylla		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	salubris		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	sp. (sterile)		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	strictifolia		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	torquata		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	transcontinentalis		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Eucalyptus	websteriana subsp. websteriana		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Metaleuca	eleuterostachya		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Metaleuca	homoia		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Myrtaceae	Metaleuca	sheathiana		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pittosporaceae	Pittosporum	angustifolium		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Poaceae	Aristida	conferta		A	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Poaceae	Austrostipa	elegantissima		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Poaceae	Austrostipa	nido		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Poaceae	Austrostipa	trichophylla		P	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Family	Genus	Species	Conservation Status	Annual, Perennial or Non-Native	a	aa	ab	ac	ad	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
Poaceae	Eragrostis	dielsii		A																														
Poaceae	Eragrostis	terrestris		P																														
Poaceae	Monochloa	paradoxus		P																														
Poaceae	Triodia	rigidissima		P																														
Poaceae	Triodia	scariosa		P																														
Portulacaceae	Calandrinia	eremaea sans lat.		A																														
Primulaceae	Lymschia	acutata		A, NH																														
Proteaceae	Grevillea	acutata		P																														
Proteaceae	Grevillea	nematophylla subsp. nematophylla		P																														
Pteridaceae	Cheilanthes	lasiochyta		P																														
Pteridaceae	Cheilanthes	sieberi subsp. sieberi		P																														
Rhamnaceae	Crotophaga	gracilis		P																														
Rhamnaceae	Myrtillus	subsp. myrtillus		P																														
Rutaceae	Phellodendron	laevigatum		P																														
Rutaceae	Phellodendron	lepidotum		P																														
Rutaceae	Phellodendron	megaphyllum		P																														
Rutaceae	Phellodendron	suberulatum		P																														
Rutaceae	Philotheca	brucei subsp. brucei		P																														
Rutaceae	Stackhousia	sp. Mt Keith		A																														
Santalaceae	Excoecaria	aphylla		P																														
Santalaceae	Santalum	acuminatum		P																														
Santalaceae	Santalum	spicatum		P																														
Sapindaceae	Alectryon	oleifolius		P																														
Sapindaceae	Dodonaea	adenophora		P																														
Sapindaceae	Dodonaea	lobulata		P																														
Sapindaceae	Dodonaea	microcarpa subsp. acrolobata		P																														
Sapindaceae	Dodonaea	sternocarpa		P																														
Scrophulariaceae	Dicentra	acutifolia	P1	P																														
Scrophulariaceae	Eremophila	alticola		P																														
Scrophulariaceae	Eremophila	coerulea subsp. coerulea		P																														
Scrophulariaceae	Eremophila	capitata		P																														
Scrophulariaceae	Eremophila	clavata		P																														
Scrophulariaceae	Eremophila	decipiens subsp. decipiens		P																														
Scrophulariaceae	Eremophila	georgii		P																														
Scrophulariaceae	Eremophila	globosa subsp. globosa		P																														
Scrophulariaceae	Eremophila	gracilis		P																														
Scrophulariaceae	Eremophila	interstans subsp. interstans		P																														
Scrophulariaceae	Eremophila	interstans subsp. virgata		P																														
Scrophulariaceae	Eremophila	laevigata		P																														
Scrophulariaceae	Eremophila	maculata subsp. brevifolia		P																														
Scrophulariaceae	Eremophila	minuta		P																														
Scrophulariaceae	Eremophila	officinalis subsp. angustifolia		P																														
Scrophulariaceae	Eremophila	oppositifolia subsp. angustifolia		P																														
Scrophulariaceae	Eremophila	parvifolia subsp. auricarpa		P																														
Scrophulariaceae	Eremophila	psilocalyx		P																														
Scrophulariaceae	Eremophila	scapularia		P																														
Scrophulariaceae	Eremophila	sp. Mt Jackson		P																														
Solanaceae	Dubautia	hispida		P																														
Solanaceae	Lycium	australe		P																														
Solanaceae	Solanum	centrale		P																														
Solanaceae	Solanum	hispidum		P																														
Solanaceae	Solanum	lasiochlamys		P																														
Solanaceae	Solanum	nummularium		P																														
Solanaceae	Solanum	orbiculatum		P																														
Solanaceae	Solanum	petrophilum		P																														
Solanaceae	Solanum	pilosum		P																														
Thymelaeaceae	Pimelea	microcephala subsp. microcephala		P																														
Violaceae	Hybanthus	floribundus subsp. curvifolius		P																														
Zygophyllaceae	Zygophyllum	auriculatum		P																														
Zygophyllaceae	Zygophyllum	compressum		A																														
Zygophyllaceae	Zygophyllum	eremum		P																														
Zygophyllaceae	Zygophyllum	eremum		A																														