



**Level 1**  
**Flora and Vegetation Survey**  
**for the Mt Marion Project Area**

**(Location Lease 53, M15/717, M15/999, M15/1000,  
E15/972, E15/1190, L15/220 and L15/353)**

Prepared for



**Mineral Resources Ltd**

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## 1. INTRODUCTION

Neometals Ltd (Neometals) and Mineral Resources Ltd (MRL) by its subsidiary Process Minerals International Pty Ltd (PMI) are collaborating in a joint venture to develop the Mt Marion Lithium Project. This proposed area falls within Location Lease 53, mining tenements M15/717, M15/999, M15/1000, exploration tenements E15/972, E15/1190 and miscellaneous licenses L15/220 and L15/353.

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 6,107 ha, and surrounds the current Mt Marion pit and waste landform. This report describes the results of the flora and vegetation survey conducted within the survey area, which will be utilised for future mining proposals and clearing permit applications.

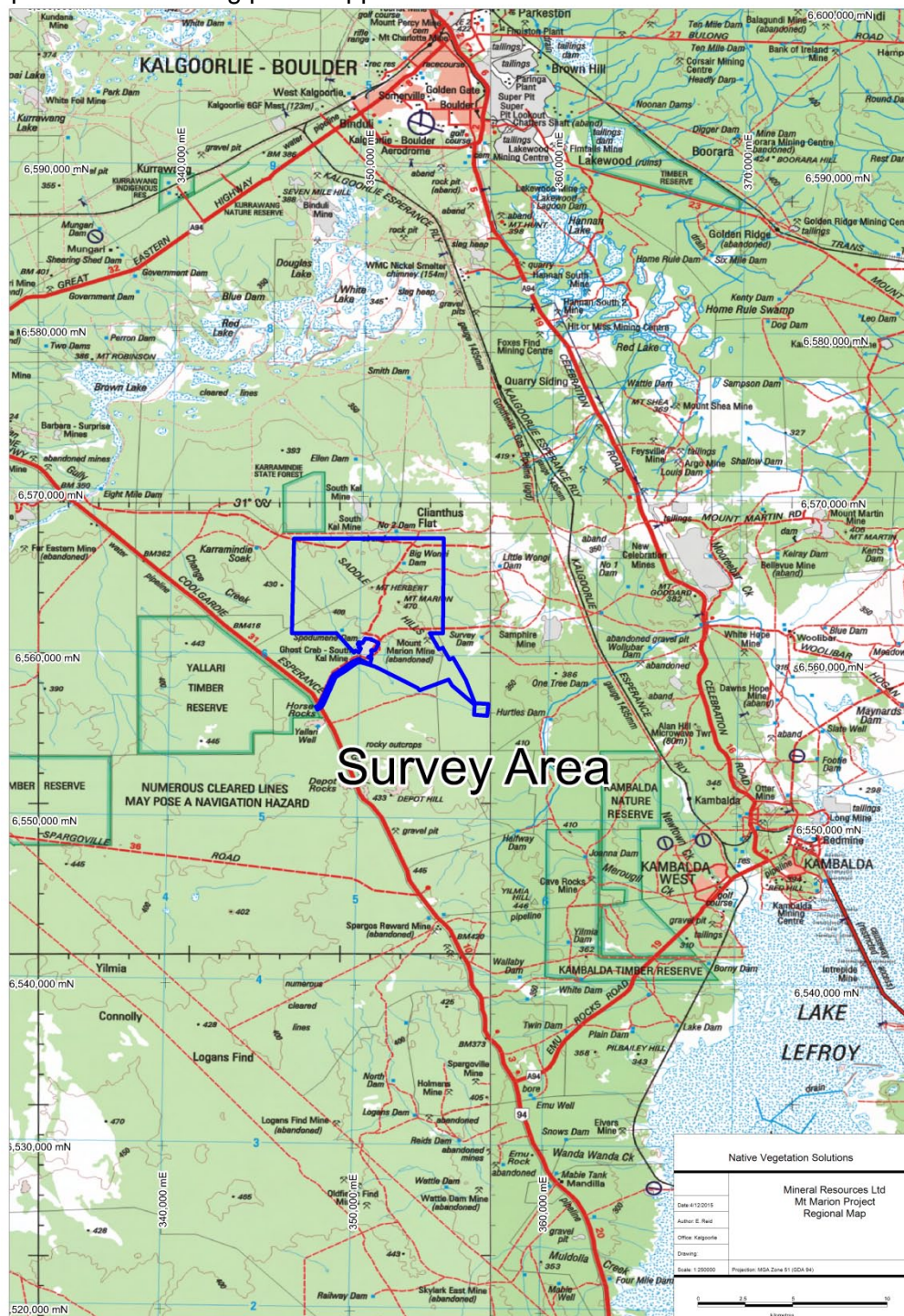


Figure 1: Regional map of survey location

MRL commissioned NVS to complete a Level 1 Flora and Vegetation Survey of the Mt Marion Project Area. NVS had previously conducted a Level 1 Flora survey in 2013 within the same boundary of the current survey area, and thus this work will be combined with new field work completed in 2015 to form one report encompassing the entire survey area.

The original field survey was conducted from the 21<sup>st</sup> to 22<sup>nd</sup> of January, 21<sup>st</sup> February, 13<sup>th</sup> and 14<sup>th</sup> and 20<sup>th</sup> of March 2013.

The recent field work was completed on 3<sup>rd</sup>, 4<sup>th</sup> and 12<sup>th</sup> October 2015, which included surveying new areas as well as rechecking previous survey areas.

## 1.1 **Objectives**

The objective of this report is to document the results of the flora and vegetation component of a Level 1 assessment conducted in accordance with the Environmental Protection Authority (EPA) "*Terrestrial Biological Surveys as an Element of Biodiversity Protection; Position Statement No 3*" (EPA 2002) and *Guidance Statement No. 51 "Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004)", for the purpose of mining.

A Level 1 study has two components:

1). Desktop study which includes a literature review and a search of the relevant databases;

and

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.

EPA's *Position Statement No. 3* (EPA 2002) provides indicative levels of biological survey in relation to the scale and nature of the impact and the sensitivity of the receiving environment. 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 a Level 1 flora and vegetation assessment is considered suitable for the survey area.

Therefore, the scope of work for the Flora and Vegetation Survey was to:

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

As part of the reporting for the Level 1 assessment, NVS has also conducted a Flora and Vegetation Field Survey which enabled broad-scale vegetation mapping and vegetation condition mapping of the survey area, whilst targeting potential Threatened Flora within the survey area.

## 1.2 **Geology and Vegetation**

The survey area lies in the Coolgardie (COO) bioregion within the Eastern Goldfields (COO3) subregion which totals over 5.1 million hectares (CALM, 2002). The COO3 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 granitites of the Fraser Range some distance to the southeast of the survey area (CALM, 2002).

### 1.3 Climate

Typically the climate is characterised as being arid to semi-arid Mediterranean with mainly winter rainfall as well as summer thunderstorms. The area receives approximately 250-300mm of rainfall per year (Beard, 1990; CALM, 2001). 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.

#### 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).

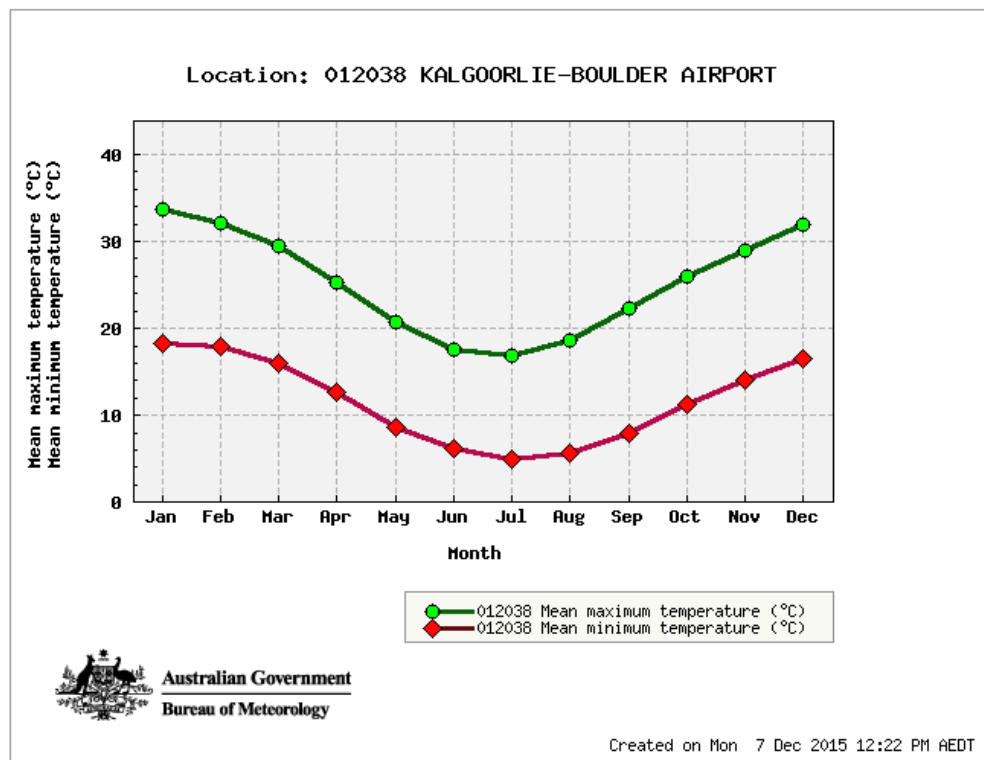


Figure 2: Mean temperature ranges for Kalgoorlie-Boulder weather station

#### 1.3.2 Rainfall

The annual average rainfall at Kalgoorlie is 266.9mm over an average 39.7 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. Rainfall for 2012



was more than twice the average for March and November, while all other months apart from July received below average levels. April and October were the driest months for 2012.

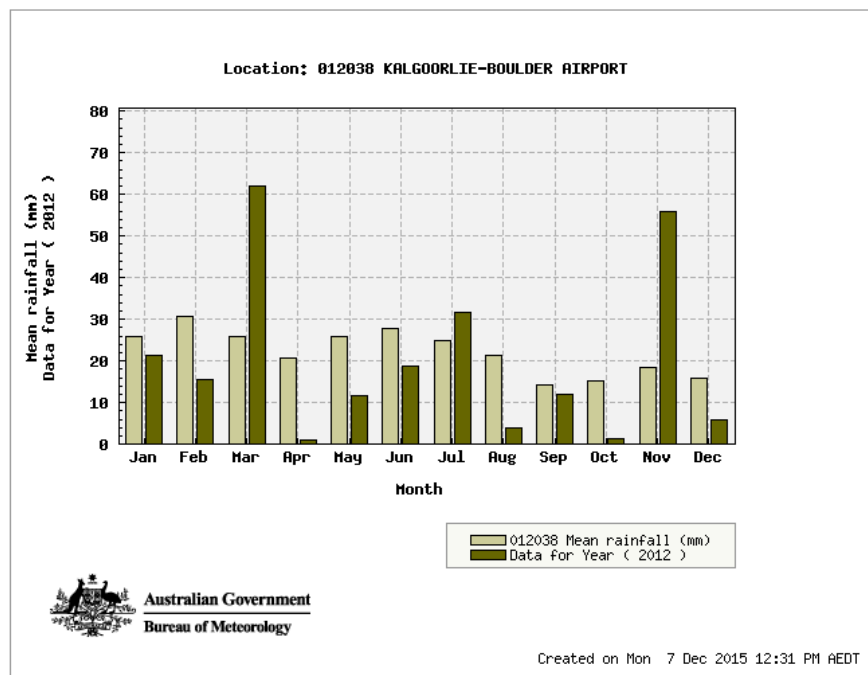


Figure 3: Monthly and mean rainfall for Kalgoorlie Boulder weather station 2012

In 2013, January and March received well above average rainfall, with May July, September and November also receiving above average rainfall.

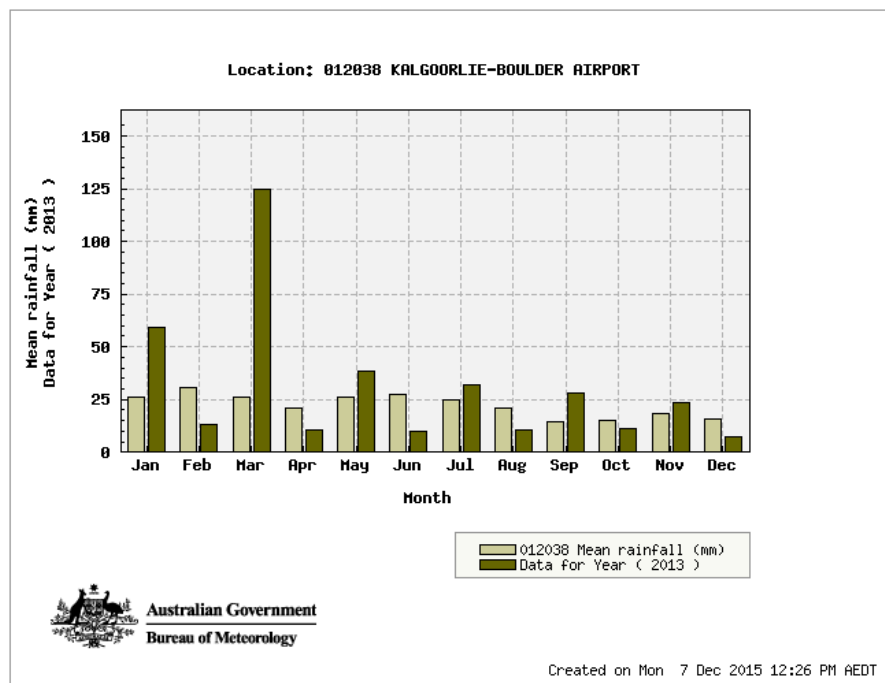


Figure 4: Monthly and mean rainfall for Kalgoorlie Boulder weather station 2013

In 2015, August and November received twice the average monthly rainfall, following below average monthly rainfall in previous months.

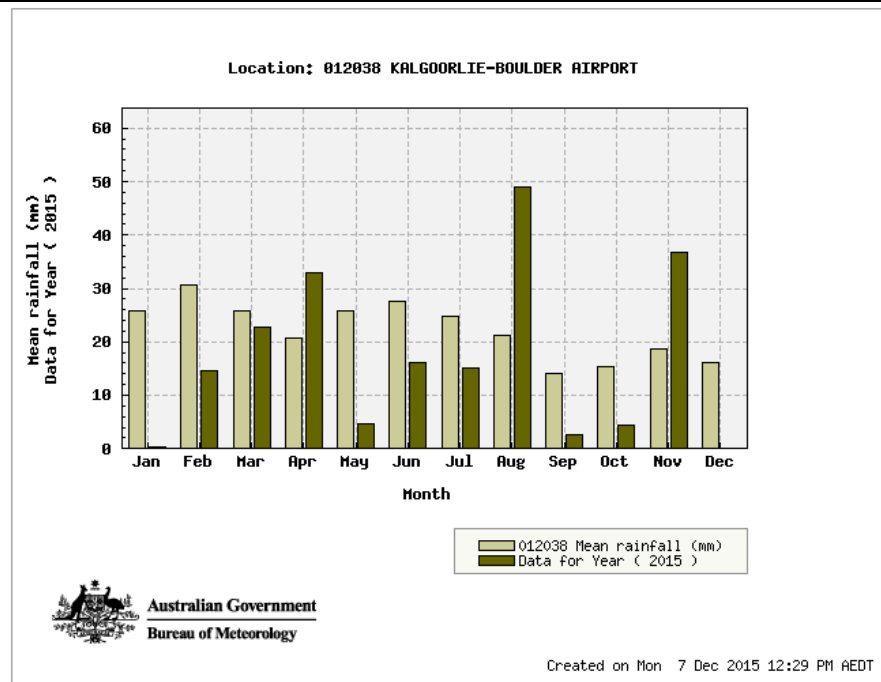


Figure 5: Monthly and mean rainfall for Kalgoorlie Boulder weather station 2015

## 2. ASSESSMENT METHODOLOGY

### 2.1 Preliminary Desktop Study

A preliminary assessment of the survey area and its potential constraints was undertaken by reviewing a number of government agency managed databases (see Appendix 1). The following sections provide a summary of the methodology used for each potential environmental aspect associated with the project.

#### 2.1.1 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>)

#### 2.1.2 Threatened Flora and Communities

The Species and Communities Branch of the Department of Parks and Wildlife (DPaW) was contacted for a search of their databases containing known populations of threatened flora within a 40km buffer of GPS coordinates GDA94 51J 345200mE 6563700mN (Reference: 10-1115FL).

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

#### 2.1.3 Environmentally Sensitive Areas (ESAs) and Conservation Reserves

Department of Environment Regulation (DER) Clearing Permit System Native Map Viewer was used to determine the location of any ESAs and Conservation Reserves (<https://cps.der.wa.gov.au/main.html>).

#### **2.1.4 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. This data comprises Beard’s Pre-European vegetation groups.

Note: This data was provided to Native Vegetation Solutions via a license agreement with the DAFWA.

DPaW’s Statewide Vegetation Statistics (DPaW, 2014) was also referenced for the current extent of Beard’s Vegetation Groups.

#### **2.1.5 Wetlands**

The location of wetlands within the project area was determined by examining DER’s Clearing Permit System Native Map Viewer (<https://cps.der.wa.gov.au/main.html>).

#### **2.1.6 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 26<sup>th</sup> parallel.

### **2.2 Site Investigation**

A site visit was carried out by Botanist Eren Reid and Consultant Ashley Owen from Native Vegetation Solutions from the 21<sup>st</sup> to 22<sup>nd</sup> of January, 21<sup>st</sup> February, 13<sup>th</sup>, 14<sup>th</sup> and 20<sup>th</sup> of March 2013, and 3<sup>rd</sup>, 4<sup>th</sup> and 12<sup>th</sup> October 2015 to examine the flora and vegetation groups contained within the survey area. A total of 9 days was spent on site traversing the survey area, by Kawasaki Mule and on foot.

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

#### **2.2.1 Licenses**

Flora was collected for identification under the Scientific Collection License SL010070 held by Mr E. R. Reid with expiry 28/06/2013, and Scientific Collection License SL011497 held by Mr E. R. Reid with expiry 09/07/2016.

### **2.3 Personnel and Reporting**

The following personnel were involved in the preparation of this report;

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

## 2.4 Limitations

Table 1 lists potential limitations that may have affected the survey. These are based on the listing given in the *Guidance Statement No. 51 Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA, 2004). As shown, this survey was not limited by any factors listed below.

**Table 1: 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, and Threatened Flora could be targeted.
Sources of information	N	Threatened and Priority Flora GIS information was available from DPaW.
Proportion of the task achieved	N	All tasks completed
Timing/Season	N	The targeted survey was conducted in Summer to Autumn 2013, and Spring 2015. 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 DAFWA (2015), 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 (DOTE, 2015).

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 DPaW database searches revealed that 3 Threatened and 67 Priority Flora species occur within a 40km radius of the survey area (DPaW, 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 (DPaW, 2015a).

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

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

### 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 (DER, 2015). The closest DPaW Managed land was the Class C Yallari Timber Reserve located on the western side of the Coolgardie-Esperance Highway (DER, 2015). This Timber Reserve is vested with the Conservation Commission for the purpose of Timber Production, however is considered by the DPaW as an area for the conservation of flora and fauna.

The Karramindie 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 2, 3, 4, 5 and 6 below. This information has been compiled through both desktop assessments and the site visit.

**Table 2: 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				
	<b>By Association (WA)</b>	<b>By Association (WA)</b>	<b>By IBRA Region (COO)</b>	<b>By IBRA Sub-region (COO3)</b>	<b>By Shire (Shire of Coolgardie)</b>
	244,735*	240,509**	240,441**	235,047**	166,563**
% 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: DPaW, (2014)

\*\*\* Source: Field Assessment

**Table 3: 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				
	<b>By Association (WA)</b>	<b>By Association (WA)</b>	<b>By IBRA Region (COO)</b>	<b>By IBRA Sub-region (COO3)</b>	<b>By Shire (Shire of Coolgardie)</b>
	503,092*	329,836**	184,549**	26,871**	96,232**
% Pre-European Extent Remaining	60.14%*	87.54%**	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: DPaW, (2014)

\*\*\* Source: Field Assessment

**Table 4: 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 ( <i>E. flocktoniae</i> )				
Pre-European Extent (ha)	Scale				
	<b>By Association (WA)</b>	<b>By Association (WA)</b>	<b>By IBRA Region (COO)</b>	<b>By IBRA Sub-region (COO3)</b>	<b>By Shire (Shire of Coolgardie)</b>
	676,324*	709,715**	688,407**	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: DPaW, (2014)

\*\*\* Source: Field Assessment

**Table 5: 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				
	<b>By Association (WA)</b>	<b>By Association (WA)</b>	<b>By IBRA Region (COO)</b>	<b>By IBRA Sub-region (COO3)</b>	<b>By Shire (Shire of Coolgardie)</b>
	924,675*	698,752**	586,792**	310,897**	359,106**
% 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: DPaW, (2014)

\*\*\* Source: Field Assessment

**Table 6: 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				
	<b>By Association (WA)</b>	<b>By Association (WA)</b>	<b>By IBRA Region (COO)</b>	<b>By IBRA Sub-region (COO3)</b>	<b>By Shire (Shire of Coolgardie)</b>
	1,981,503*	1,679,917**	1,061,213**	107,974**	334,488**
% Pre-European Extent Remaining	67.05%*	76.61%**	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: DPaW, (2014)

\*\*\* Source: Field Assessment

### 3.1.5 Wetlands

No wetlands which are recorded on the DER Clearing Permit System Map Viewer occur within the survey area (DER, 2015).

### 3.1.6 Dieback

The survey area lies south of the 26<sup>th</sup> parallel, however receives average annual rainfall of 266.9mm, 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 plant taxa located in the survey area are gazetted as DRF pursuant to subsection 2 of Section 23F of the *Wildlife Conservation Act 1950*. No plant taxa listed as Threatened pursuant to Schedule 1 of the *Environment Protection and Biodiversity Conservation Act 1999* was located in 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, based on the method mentioned above.

**Table 6: 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.



### 3.2.2 Vegetation Type, Extent and Status

A total of 38 families, 82 genera and 186 species were recorded within the survey area. Twenty three major vegetation groups were recorded in the survey area, and are considered to be in Very Good, Good or Degraded condition (using the scale of Keighery 1994, see Appendix 3). Maps of the survey area can be seen in Appendix 4.

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 2,506.95 ha which makes up 41.05% of the survey area.

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



Figure 6: Transitional *Eucalyptus* woodland over mixed shrubland within the survey area



### 3.2.2.2 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 1,502.31 ha which makes up 24.6% of the survey area.

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



Figure 7: Mixed *Eucalyptus* woodland over sclerophyll shrubland within the survey area



### 3.2.2.3 *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 571.24 ha which makes up 9.35% of the survey area.

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



Figure 8: *Acacia acuminata* shrubland with emergent *Eucalyptus griffithsii* within the survey area



### 3.2.2.4 Open *Eucalyptus salmonophloia* woodland (d)

This vegetation group consisted of 11 Families, 16 Genera and 25 Species. The vegetation group was approximately 314.32 ha which makes up 5.15% of the survey area.

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



Figure 9: Open *Eucalyptus salmonophloia* woodland within the survey area



### 3.2.2.5 *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 4.27% of the survey area.

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



Figure 10: *Eucalyptus salmonophloia* woodland over *Maireana sedifolia* shrubland within the survey area



### 3.2.2.6 *Eucalyptus salmonophloia* woodland over mixed shrubland (f)

This vegetation group consisted of 12 Families, 21 Genera and 40 Species. The vegetation group was approximately 81.2 ha which makes up 1.33% of the survey area.

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



Figure 11: *Eucalyptus salmonophloia* woodland over mixed shrubland within the survey area



### 3.2.2.7 *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 78.33 ha which makes up 1.28% of the survey area.

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



Figure 12: *Eucalyptus lesouefii* and *E. gracilis* woodland on rocky hill slopes within the survey area



### 3.2.2.8 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 228.65 ha which makes up 3.74% of the survey 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 13: Mixed *Eucalyptus* woodland over *Melaleuca sheathiana* shrubland within the survey area



### 3.2.2.9 *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 3.54% of the survey area.

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



Figure 14: *Eucalyptus ravida* woodland within the survey area

### 3.2.2.10 *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 0.48% of the survey area.

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



Figure 15: *Eucalyptus stricklandii* over *Acacia* and sclerophyll shrubland within the survey area



### 3.2.2.11 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 0.39% of the survey area.

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



Figure 16: Mixed *Eucalyptus* woodland over sclerophyll shrubland with *Diocirea acutifolia* (P3) on undulating hills within the survey area



### 3.2.2.12 *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 19.33 ha which makes up 0.32% of the survey area.

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



Figure 17: *Melaleuca sheathiana* shrubland with *Eucalyptus oleosa* over *Cratystylis conocephala* within the survey area



### 3.2.2.13 *Eucalyptus lesouefii* woodland (m)

This vegetation group consisted of 8 Families, 12 Genera and 24 Species. The vegetation group was approximately 37.39 ha which makes up 0.61% of the survey area.

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



Figure 18: *Eucalyptus lesouefii* shrubland within the survey area



### 3.2.2.14 *Eucalyptus gracilis* woodland (n)

This vegetation group consisted of 4 Families, 5 Genera and 8 Species. The vegetation group was approximately 24.71 ha which makes up 0.40% of the survey area.

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



Figure 19: *Eucalyptus gracilis* woodland within the survey area



### 3.2.2.15 *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 0.25% of the survey area.

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



Figure 20: *Eucalyptus stricklandii* woodland over *Tecticornia* open shrubland within the survey area



### 3.2.2.16 *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.

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



Figure 21: *Eucalyptus transcontinentalis* and *E. campaspe* woodland over *Melaleuca sheathiana* shrubland within the survey area



### 3.2.2.17 *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.

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



Figure 22: *Casuarina pauper* shrubland with *Eucalyptus lesouefii* over mixed shrubland across greenstone hills within the survey area



### 3.2.2.18 *Eucalyptus griffithsii* woodland (r)

This vegetation group consisted of 20 Families, 26 Genera and 55 Species. The vegetation group was approximately 37.62 ha which makes up 0.62% of the survey area.

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



Figure 23: *Eucalyptus griffithsii* woodland within the survey area



### 3.2.2.19 *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 0.24% of the survey area.

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



Figure 24: *Eucalyptus campaspe* and *E. gracilis* woodland within the survey area



### 3.2.2.20 *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.

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



Figure 25: *Eucalyptus stricklandii* and *E. lesouefii* woodland over *Beyeria sulcata* within the survey area



### 3.2.2.21 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.

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



Figure 26: Transitional *Eucalyptus* woodland over *Diocirea acutifolia*



### 3.2.2.22 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.



**Figure 27: Existing Disturbance within the survey area**



### 3.2.2.23 *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.

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



Figure 28: *Acacia quadrimarginea* over *Allocasuarina* shrubland within the survey area



### 3.2.2.24 Revegetation Shrubland (y)

This vegetation group consisted of 14 Families, 19 Genera and 39 Species. The vegetation group was approximately 105.08 ha which makes up 1.72% of the survey area.

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



Figure 29: Revegetation Shrubland 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 DAFWA (2015).

### 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 "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 Minerals and Petroleum (DMP) assesses clearing permits against ten principles relating to the effect of clearing. NVS submits the following comments regarding the Clearing principles specifically related to Native Vegetation;

**(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 186 flora taxa representing 38 families and 82 genera were found during field survey, the vegetation is typical of the region and surrounding regions and not considered to be unusually diverse.

**(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 DPaW records located between 12km and 112km from the survey area.

**(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.

**(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 60-100% of their spatial area remaining post European settlement, and are not adversely affected by extensive clearing such as farming.

**(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 DER Clearing Permit System Map Viewer (DER, 2015).

**(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 DPaW Managed land is the "Class C" Yallari Timber Reserve located approximately 2.3km southwest of the survey area (DEC, 2013b). This Timber Reserve is vested with the Conservation Commission for the purpose of Timber Production, however is considered by DPaW as an area for the conservation of flora and fauna.

#### **4. DISCUSSION**

The field assessment established that the condition of the vegetation in the survey area is overall "Very Good", with 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 DPaW 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 Level 1 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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 Accessed 07/12/2015

## **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: 07/12/15 12:43:25

[Summary](#)

[Details](#)

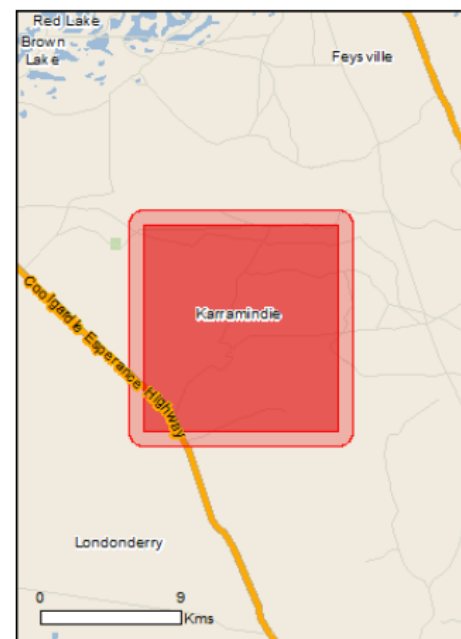
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are  
©Commonwealth of Australia  
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[Coordinates](#)

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](#).

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	None
<a href="#">Listed Threatened Species:</a>	3
<a href="#">Listed Migratory Species:</a>	5

### Other Matters Protected by the EPBC Act

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

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

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

<a href="#">Commonwealth Land:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	5
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Commonwealth Reserves Marine:</a>	None

### Extra Information

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

<a href="#">State and Territory Reserves:</a>	1
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	11
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">Key Ecological Features (Marine)</a>	None



## Details

### Matters of National Environmental Significance

Listed Threatened Species		[ Resource Information ]
Name	Status	Type of Presence
<b>Birds</b>		
<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Pezoporus occidentalis</a> Night Parrot [59350]	Endangered	Species or species habitat may occur within area
<b>Plants</b>		
<a href="#">Gastrolobium graniticum</a> 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
<b>Migratory Marine Birds</b>		
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<b>Migratory Wetlands Species</b>		
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area

## Other Matters Protected by the EPBC Act

### Listed Marine Species [ Resource Information ]

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

Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Apus pacificus</a>		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a>		
Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
<a href="#">Ardea ibis</a>		
Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Merops ornatus</a>		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a>		
Grey Wagtail [642]		Species or species habitat may occur within area

## 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
<b>Birds</b>		
<i>Columba livia</i>		
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
<i>Streptopelia senegalensis</i>		
Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
<b>Mammals</b>		
<i>Canis lupus familiaris</i>		
Domestic Dog [82654]		Species or species habitat likely to occur within area
<i>Capra hircus</i>		
Goat [2]		Species or species habitat likely to occur



Name	Status	Type of Presence
		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 habitat likely to occur within area
<b>Plants</b>		
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.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

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

-31.01522 121.38807,-31.01522 121.49968,-31.117053 121.49968,-31.117053 121.38807,-31.01522 121.38807



## Acknowledgements

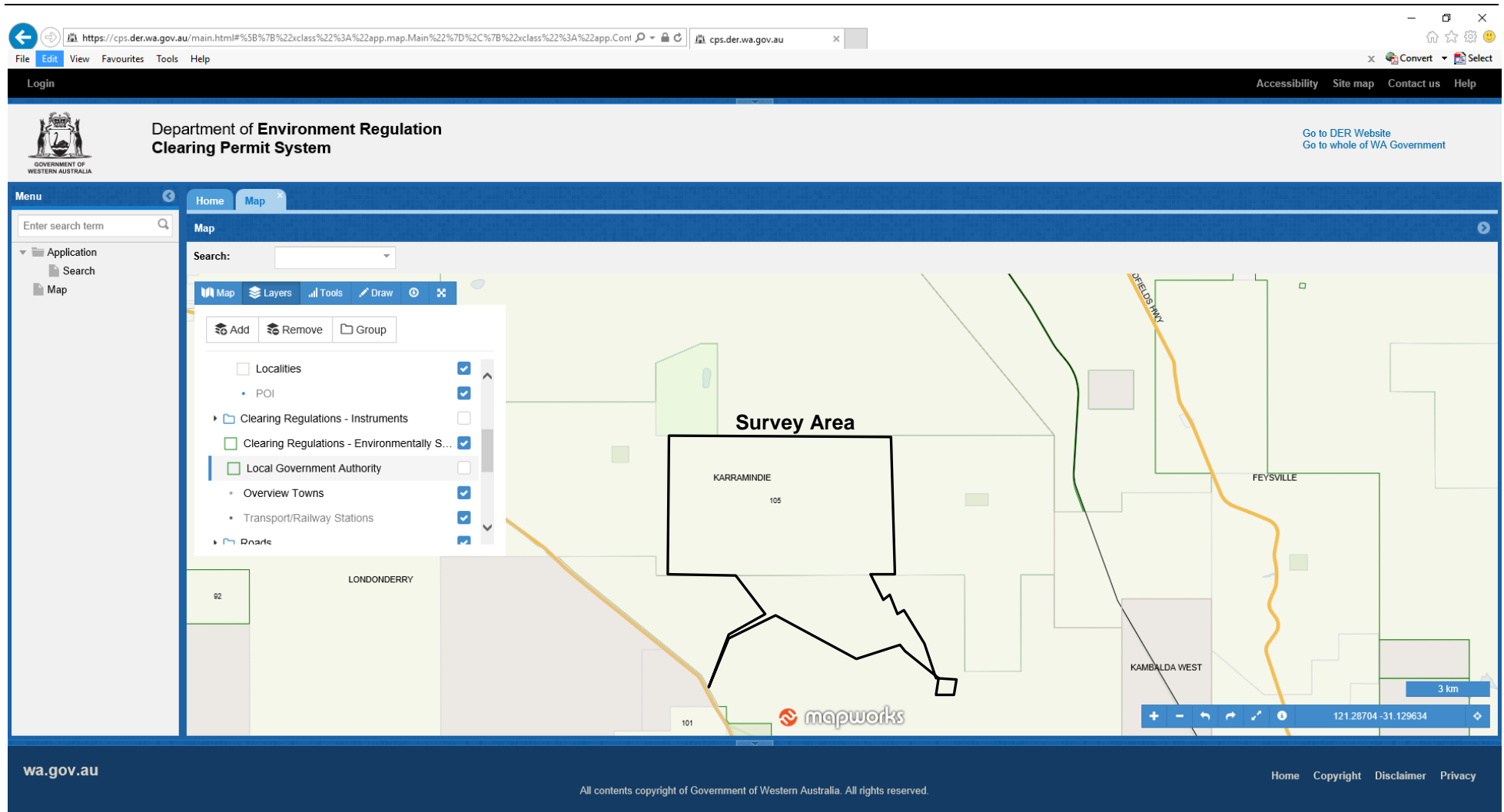
This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [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](#)
- [Parks and Wildlife Commission NT, Northern Territory Government](#)
- [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, Atherton and Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- 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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DER Clearing Permit System Map Viewer showing no ESA's (dark green shaded areas) within the survey area (DER, 2015)





## **Appendix 2**

### **Threatened Flora Databases Search Results**



Taxon	Threatened Flora Status	DPaW Region	DPaW District	Distribution	Flowering Period
<i>Acacia coatesii</i>	1	GOLD	KALGOORLIE	Coolgardie	
<i>Acacia crenulata</i>	3	GOLD,WHTB	KALGOORLIE,CENTRAL WHEATBELT	Southern Cross, Carrabin, Bullabulling, Walyahmoning Rock, Chiddarcooping, Sandford Rocks N.R., Marvel Loch	Sep-Oct
<i>Acacia sciophanes</i>	T	WHTB	CENTRAL WHEATBELT	Mukinbudin, Victoria Rock	Sep-Jan
<i>Acacia websteri</i>	1	GOLD,WHTB	KALGOORLIE,CENTRAL WHEATBELT	Bencubbin, Coolgardie	-
<i>Austrostipa blackii</i>	3	GOLD,MWST,WHT B	KALGOORLIE,GERALDTON,GREAT SOUTHERN,CENTRAL WHEATBELT	Merredin, Dalwallinu, Jaurdi, Widgiemooltha, eastern States, Tutanning Nature Reserve, Beverley, Blue Hills Range, Yandaroo Hills,Mt Manning Range, Barcooting Hill	
<i>Baeckea</i> sp. Gnarlbine Rocks (G. Barrett GRH469)	1	GOLD	KALGOORLIE	Gnarlbine Rocks, Coolgardie	Oct
<i>Baeckea</i> sp. Wialki (G.M. Storr s.n. 4/10/1958)	1	GOLD,WHTB	KALGOORLIE,CENTRAL WHEATBELT	Wialki, Bonnie Rock, Diemals	Oct-Nov
<i>Banksia lullfitzii</i>	3	GOLD,SCST,WHTB	KALGOORLIE,ESPERANCE,GREAT SOUTHERN,CENTRAL WHEATBELT	Southern Cross, Frank Hann N.P., Coolgardie, Mt Manning Range, Ravensthorpe	Mar-May
<i>Bossiaea concinna</i>	3	GOLD,SCST,WHTB	KALGOORLIE,ALBANY,CENTRAL WHEATBELT	Cunderdin, Woolgangie, Coolgardie, Lake Mason Stn, Jerramungup, Pithara	Sep,Oct
<i>Bossiaea laxa</i>	2	GOLD	KALGOORLIE	Widgiemooltha	May
<i>Calandrinia kalanniensis</i>	2	WHTB	CENTRAL WHEATBELT	Kalannie, Petrudor Rock, Xantippe Rock, Karara Station, Bonnie Rock, Yanneymooning NR, Hughden Rock	Dec-Jan
<i>Cryptandra crispula</i>	3	GOLD,SCST	KALGOORLIE,ESPERANCE	Lake Lefroy, Bullabulling, Karonie, Fraser Range	Jul-Sep
<i>Cyathostemon divaricatus</i>	1	GOLD	KALGOORLIE	Red Hill, Kambalda	Aug
<i>Cyathostemon verrucosus</i>	3	GOLD	KALGOORLIE	Bungalbin Hill, Helena & Aurora Ranges, Queen Victoria Rocks, Kalgoorlie, Boorabbin	Sep-Dec,Mar
<i>Dampiera plumosa</i>	1	GOLD,MWST	KALGOORLIE,GERALDTON	Sandstone, Coolgardie, Lake Barlee	Oct
<i>Diocirea acutifolia</i>	3	GOLD	KALGOORLIE	Coolgardie, Kambala,	Nov-Dec

Taxon	Threatened Flora Status	DPaW Region	DPaW District	Distribution	Flowering Period
				Widgiemooltha	
<i>Diocirea microphylla</i>	3	GOLD,SCST	KALGOORLIE,ESPERANCE	Bullabulling, Gibraltar, Maggie Hays Hill, Lake Johnston	Dec
<i>Eremophila arachnoides</i> subsp. <i>tenera</i>	1	GOLD	KALGOORLIE	Kambalda, Laverton	Sep,Dec
<i>Eremophila veronica</i>	3	GOLD	KALGOORLIE	Queen Victoria Rock, Coolgardie	Oct-Nov
<i>Eucalyptus pterocarpa</i>	4	GOLD,SCST	KALGOORLIE,ESPERANCE	Norseman, Bronzite Ridge, Victoria Rock	Sep-Nov
<i>Eucalyptus websteriana</i> subsp. <i>norsemanica</i>	1	GOLD,SCST	KALGOORLIE,ESPERANCE	Norseman, Coolgardie	-
<i>Eucalyptus x brachyphylla</i>	4	GOLD	KALGOORLIE	Lake Lefroy, Karonie, Widgiemooltha	-
<i>Gastrolobium graniticum</i>	T	GOLD,WHTB	KALGOORLIE,CENTRAL WHEATBELT	Coolgardie,Gnamma Hill,Narembeen,Yellowdine, Bullabulling	Aug-Nov
<i>Goodenia corralina</i>	2	GOLD	KALGOORLIE	Widgiemooltha	May
<i>Grevillea phillipsiana</i>	1	GOLD,SCST	KALGOORLIE,ESPERANCE	Norseman, Yardina, Kambalda, Widgiemooltha	Aug-Sep
<i>Hibbertia pachyphylla</i>	3	GOLD,SCST,WHTB	KALGOORLIE,ESPERANCE,CENTRAL WHEATBELT	Frank Hann NP, Forrestania, Victoria Rocks	Sep-Nov
<i>Leucopogon remotus</i>	1	SCST	ESPERANCE	N of Bonnie Hill	Sep-Oct
<i>Leucopogon</i> sp. Bonnie Hill (K.R. Newbey 9831)	1	SCST	ESPERANCE	Bonnie Hill, South of Peak Charles	May,Jun
<i>Leucopogon</i> sp. Kambalda (J. Williams s.n. PERTH 07305028)	3	GOLD	KALGOORLIE	Kambalda	Jan
<i>Leucopogon</i> sp. Yanneymooring (F. Mollemans 3797)	3	GOLD,WHTB	KALGOORLIE,CENTRAL WHEATBELT	Mukinbudin, Mt Jackson Stn., Bonnie Rock	May
<i>Melaleuca coccinea</i>	3	GOLD,SCST	KALGOORLIE,ALBANY,ESPERANCE	Karonie, Boulder, Widgiemooltha, Erayinia Hill, Norseman, Ravensthorpe	Oct-Nov
<i>Melaleuca macrorychia</i> subsp. <i>trygonoides</i>	3	GOLD,SCST	KALGOORLIE,ESPERANCE	Lake View Rock, McDermid Rock, Queen Victoria Rock, Cave Hill	Feb,Jul,Aug
<i>Melichrus</i> sp. Coolgardie (K.R. Newbey 8698)	1	GOLD	KALGOORLIE	Coolgardie	
<i>Mirbelia densiflora</i>	3	GOLD,SCST,WHTB	KALGOORLIE,ESPERANCE,CENTRAL WHEATBELT	Frank Hann NP, Kumarl, Hatter Hill, Peak Charles, Forrestania, Mt Gibbs, Victoria Rock	Jan
<i>Persoonia leucopogon</i>	1	GOLD	KALGOORLIE	Between Coolgardie & Laverton, Comet Vale (Menzies)	-
<i>Phebalium drummondii</i>	3	WHTB	GREAT SOUTHERN,CENTRAL WHEATBELT	Dowerin, Bonnie Rock,	Oct-Nov



Taxon	Threatened Flora Status	DPaW Region	DPaW District	Distribution	Flowering Period
				Wialki, Koorda-Mollerin, Manmanning, Hyden, Lake Grace	
<i>Philotheca apiculata</i>	2	GOLD,SCST,WHTB	KALGOORLIE,ESPERANCE,CENTRAL WHEATBELT	Norseman, Mt Kirk, Widgiemooltha, Holleaton	Aug-Sep
<i>Phlegmatospermum eremaeum</i>	3	GOLD,SCST,WHTB	KALGOORLIE,ESPERANCE,CENTRAL WHEATBELT	Coolgardie, Norseman, Cocklebidy, Forrest, Bruce Rock, Helena and Aurora Range, Caiguna	Aug-Oct
<i>Pityrodia scabra</i> subsp. <i>dendrotricha</i>	3	GOLD,WHTB	KALGOORLIE,CENTRAL WHEATBELT	Forrestania, Marvel Loch, Jilbadji, Norseman, Southern Cross (Barker Lake), Widgiemooltha	Oct,Nov
<i>Prostanthera splendens</i>	1	GOLD,SCST	KALGOORLIE,ESPERANCE	Widgiemooltha, Higginsville, Cascade	Aug-Oct
<i>Psammomoya ephedroides</i>	3	GOLD,MWST,SCST	KALGOORLIE,ALBANY,GERALDTON	Toolong N.R., Kalbarri, Woolgorong, Mount Gibson, Coolgardie, Albany	
<i>Ptilotus rigidus</i>	1	GOLD	KALGOORLIE	Widgiemooltha, Lake Lefroy	
<i>Stylidium choreanthum</i>	3	GOLD,WHTB	KALGOORLIE,CENTRAL WHEATBELT	Helena & Aurora Range, Ghooli, Southern Cross, Kambalda, Koolyanobbing, Jaurdi Station, Ennuin Stn	Sep-Oct
<i>Styphelia</i> sp. Bullfinch (M. Hislop 3574)	3	GOLD,WHTB	KALGOORLIE,CENTRAL WHEATBELT	Jackson Range, Bullfinch, Koolyanobbing, Bullabulling, Diemals Stn.	Apr-May
<i>Tecticornia flabelliformis</i>	1	GOLD,WHTB	KALGOORLIE,CENTRAL WHEATBELT	Lake Yindarlgooda, Lake Deborah, Widgiemooltha, Eastern States	
<i>Tetratea spenceri</i>	T	GOLD	KALGOORLIE	Kambalda West	Oct
<i>Thryptomene</i> sp. Londonderry (R.H. Kuchel 1763)	1	GOLD	KALGOORLIE	Coolgardie, Kambalda	
<i>Verticordia stenopetala</i>	3	GOLD,WHTB	KALGOORLIE,CENTRAL WHEATBELT	Mt Holland, Moorine Rock, Queen Victoria Rock, Marvel Loch, Carrabin, Mt Walton, Holleaton	Oct

The GIS database results (DPAW, 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>Austrostipa</i> sp. Carlingup Road (S. Kern & R. Jasper LCH 18459)	1
<i>Austrostipa</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.

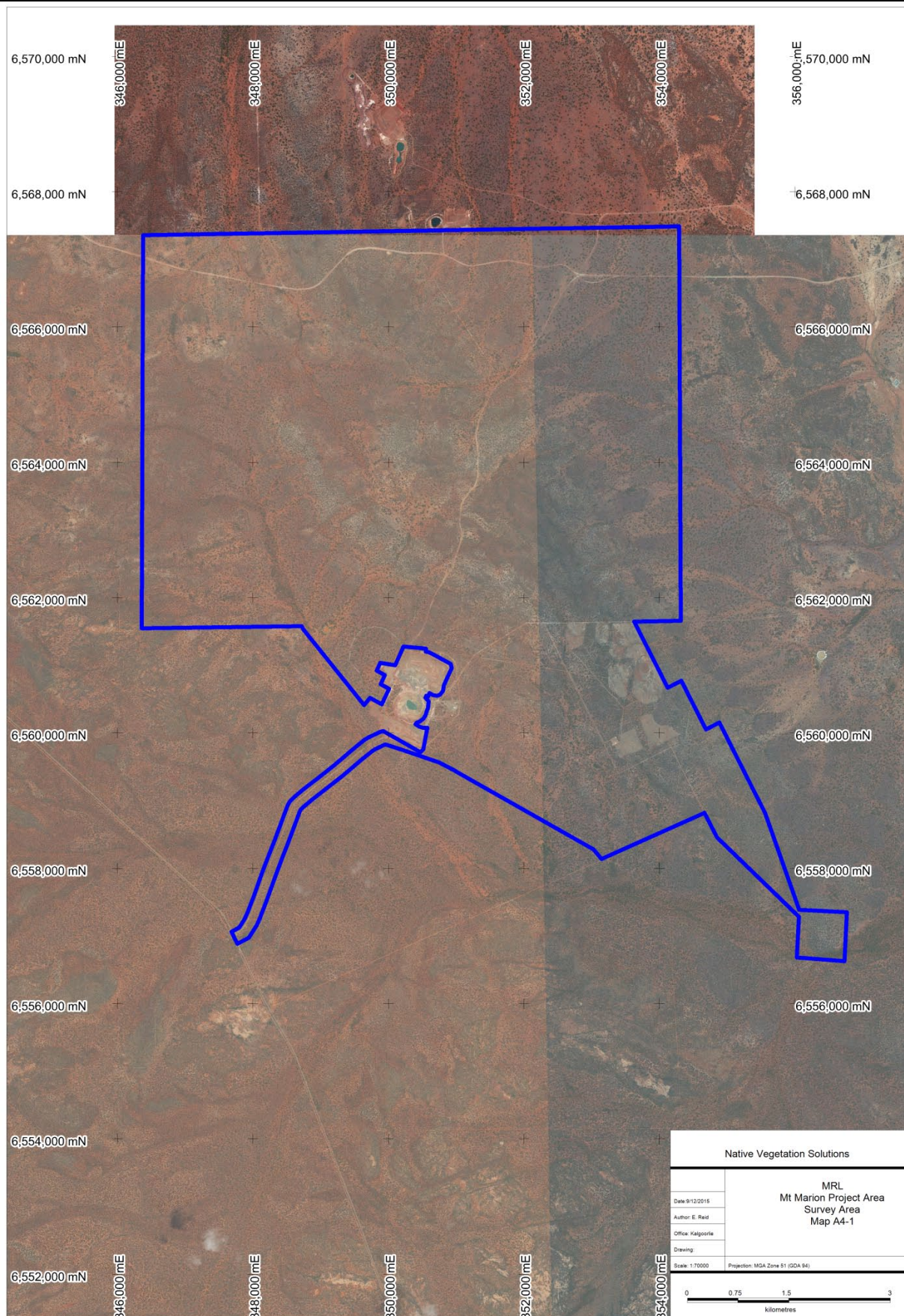
**Degraded (5).** Basic vegetation structure severely impacted by disturbance.  
Scope for regeneration but not to a state approaching good condition without intensive management.  
For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds,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

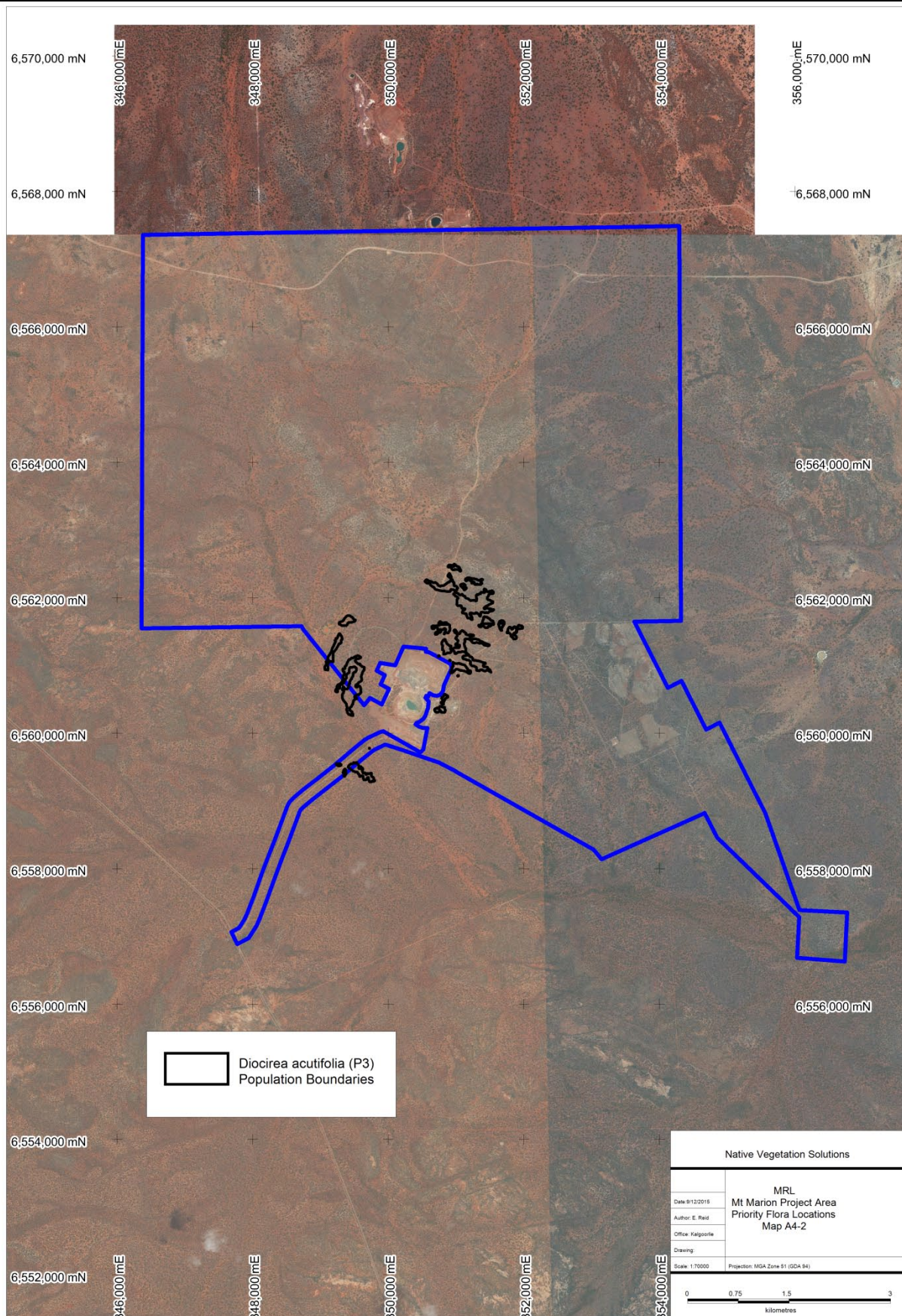
## **Appendix 4**

# **Vegetation Mapping**

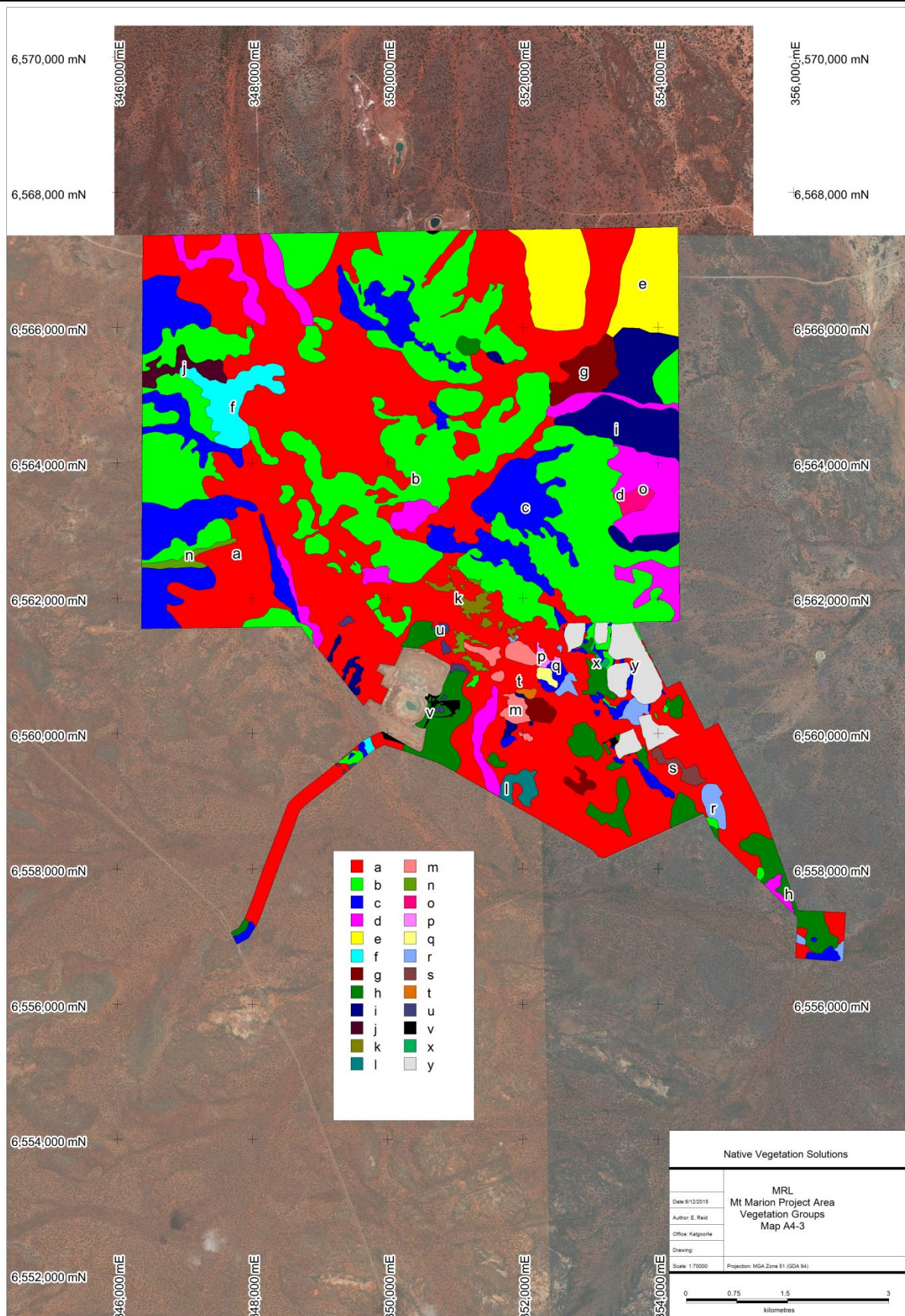




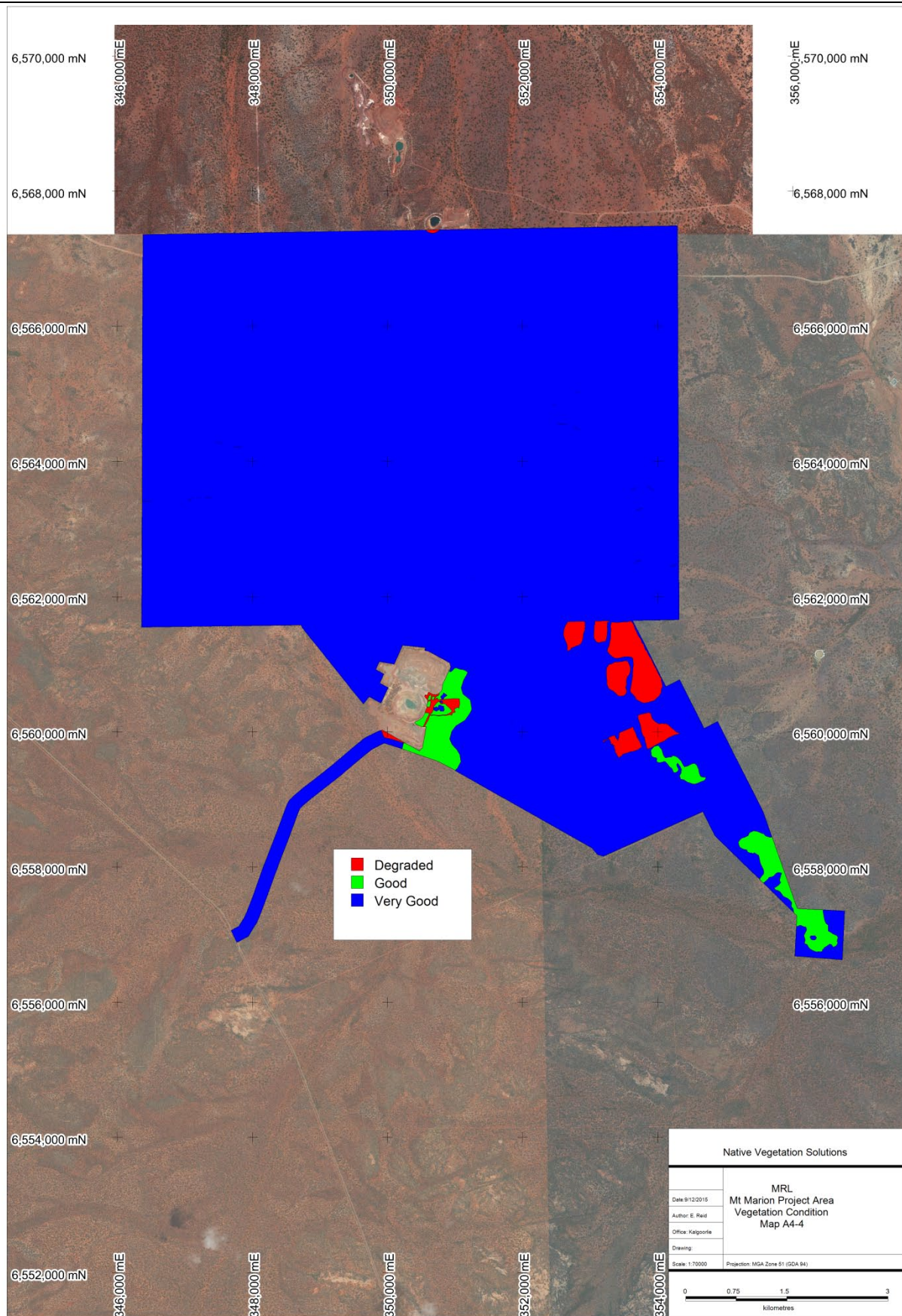












## **Appendix 5**

### **Species List**

				Annual, Perennial or Non Native	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	x	y
Family	Genus	Species	Conservation Status																									
Aizoaceae	<i>Tetragonia</i>	<i>eremaea</i>		A	*																	*						
Amaranthaceae	<i>Ptilotus</i>	<i>aeroides</i>		A	*																	*						
Amaranthaceae	<i>Ptilotus</i>	<i>nobilis</i> subsp. <i>nobilis</i>		A	*	*		*		*			*							*		*		*	*			
Amaranthaceae	<i>Ptilotus</i>	<i>obovatus</i>		P	*	*	*	*	*				*	*	*	*						*	*		*			*
Amaranthaceae	<i>Ptilotus</i>	<i>polystachyus</i>		A	*																				*			
Amaranthaceae	<i>Ptilotus</i>	<i>roei</i>		A	*																				*			
Apocynaceae	<i>Alyxia</i>	<i>buxifolia</i>		P	*	*	*	*			*	*		*	*	*				*	*			*	*			
Apocynaceae	<i>Marsdenia</i>	<i>australis</i>		P	*	*	*	*			*		*	*	*				*			*			*			
Araliaceae	<i>Trachymene</i>	<i>ornata</i>		A			*																					
Asparagaceae	<i>Thysanotus</i>	<i>manglesianus</i>		P	*															*				*				
Asteraceae	<i>Actinobole</i>	<i>uliginosum</i>		A			*																					
Asteraceae	<i>Angianthus</i>	<i>tomentosus</i>		A			*																					
Asteraceae	<i>Chrysocephalum</i>	<i>puteale</i>		P			*																					
Asteraceae	<i>Chthonocephalus</i>	<i>pseudevax</i>		A			*																					
Asteraceae	<i>Cratystylis</i>	<i>conocephala</i>		P	*				*			*				*	*								*		*	
Asteraceae	<i>Cratystylis</i>	<i>microphylla</i>		P	*					*										*					*		*	
Asteraceae	<i>Cratystylis</i>	<i>subspinescens</i>		P	*																							
Asteraceae	<i>Olearia</i>	<i>muelleri</i>		P	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
Asteraceae	<i>Olearia</i>	<i>pimeleoides</i>		P		*	*					*								*					*			
Asteraceae	<i>Ozothamnus</i>	<i>cassiope</i>		P			*																					
Asteraceae	<i>Podolepis</i>	<i>capillaris</i>		A			*																					
Asteraceae	<i>Rhodanthe</i>	<i>laevis</i>		A			*																					
Asteraceae	<i>Rhodanthe</i>	<i>oppositifolia</i> subsp. <i>oppositifolia</i>		A			*																					
Asteraceae	<i>Sonchus</i>	<i>oleraceus</i>		NN			*																					
Asteraceae	<i>Waitzia</i>	<i>acuminata</i> var. <i>acuminata</i>		A			*																				*	
Boraginaceae	<i>Halgania</i>	<i>andromedifolia</i>		P	*	*					*	*			*					*	*		*					
Brassicaceae	<i>Stenopetalum</i>	<i>filifolium</i>		A		*																						
Campanulaceae	<i>Isotoma</i>	<i>petraea</i>		A			*																					
Casuarinaceae	<i>Allocasuarina</i>	<i>acutivalvis</i> subsp. <i>acutivalvis</i>		P			*																				*	
Casuarinaceae	<i>Allocasuarina</i>	<i>campestris</i>		P			*																				*	
Casuarinaceae	<i>Allocasuarina</i>	<i>helmsii</i>		P			*																				*	
Casuarinaceae	<i>Casuarina</i>	<i>pauper</i>		P	*	*							*								*	*		*				
Chenopodiaceae	<i>Atriplex</i>	<i>bunburyana</i>		P					*																			
Chenopodiaceae	<i>Atriplex</i>	<i>codonocarpa</i>		A	*								*												*			
Chenopodiaceae	<i>Atriplex</i>	<i>nummularia</i> subsp. <i>spathulata</i>		P	*	*	*		*	*		*	*		*		*		*		*	*	*	*			*	
Chenopodiaceae	<i>Atriplex</i>	<i>vesicaria</i>		P	*				*	*		*	*				*			*		*						
Chenopodiaceae	<i>Chenopodium</i>	<i>gaudichaudianum</i>		P	*								*												*			
Chenopodiaceae	<i>Dissocarpus</i>	<i>paradoxus</i>		P	*	*	*						*									*						
Chenopodiaceae	<i>Enchylaena</i>	<i>tomentosa</i>		P	*					*	*	*	*						*						*			
Chenopodiaceae	<i>Eriochiton</i>	<i>sclerolaenoides</i>		P					*							*											*	
Chenopodiaceae	<i>Maireana</i>	<i>brevifolia</i>		P	*																	*						
Chenopodiaceae	<i>Maireana</i>	<i>cuneata</i>		P	*																				*			



				Annual, Perennial or Non Native	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	x	y
Family	Genus	Species	Conservation Status																									
Chenopodiaceae	Maireana	georgei		P	*	*				*		*	*			*				*		*			*			
Chenopodiaceae	Maireana	pentatropis		P	*	*				*		*	*				*	*				*			*			*
Chenopodiaceae	Maireana	pyramidata		P				*	*																			
Chenopodiaceae	Maireana	sedifolia		P	*				*	*			*									*						
Chenopodiaceae	Maireana	thesioides		P						*																		
Chenopodiaceae	Maireana	tomentosa		P	*	*		*	*	*		*	*			*	*		*				*		*	*		*
Chenopodiaceae	Maireana	trichoptera		P	*	*	*	*	*	*		*				*						*		*	*		*	*
Chenopodiaceae	Maireana	triptera		P	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*					*	*		*
Chenopodiaceae	Rhagodia	drummondii		P	*	*		*		*			*												*			
Chenopodiaceae	Sclerolaena	cuneata		P		*	*	*		*		*	*	*		*		*		*	*	*	*	*				
Chenopodiaceae	Sclerolaena	densiflora		P		*				*							*										*	
Chenopodiaceae	Sclerolaena	diacantha		P	*	*	*	*	*	*		*	*			*	*		*			*	*		*		*	
Chenopodiaceae	Sclerolaena	patenticuspis		P									*					*	*									
Chenopodiaceae	Tecticornia	disarticulata		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	acuminata		P	*	*	*							*	*					*		*		*	*	*	*	*
Fabaceae	Acacia	andrewsii		P	*		*																		*			
Fabaceae	Acacia	assimilis		P										*														
Fabaceae	Acacia	camptoclada		P																							*	
Fabaceae	Acacia	donaldsonii		P																							*	
Fabaceae	Acacia	erinacea		P	*	*	*			*	*	*	*			*				*	*	*	*	*	*	*	*	*
Fabaceae	Acacia	gibbosa		P			*																					
Fabaceae	Acacia	hemiteles		P	*	*	*	*		*		*	*	*	*	*	*					*	*	*	*	*	*	*
Fabaceae	Acacia	jennerae		P	*																	*						
Fabaceae	Acacia	kalgoorliensis		P		*																						
Fabaceae	Acacia	merrallii		P	*		*					*										*		*	*	*	*	*
Fabaceae	Acacia	pachypoda		P	*							*										*						
Fabaceae	Acacia	quadrimarginea		P		*	*								*											*	*	
Fabaceae	Acacia	rendlei		P	*															*				*		*	*	
Fabaceae	Acacia	resinosa		P	*																	*						
Fabaceae	Acacia	sibirica		P			*																					
Fabaceae	Acacia	tetragonophylla		P	*	*								*	*					*		*		*	*	*	*	
Fabaceae	Mirbelia	depressa		P			*																					
Fabaceae	Mirbelia	granitica		P			*																					
Fabaceae	Senna	artemisioides subsp. artemisioides		P	*	*	*	*		*					*		*		*			*		*	*	*	*	*
Fabaceae	Senna	artemisioides subsp. filifolia		P	*	*	*	*	*	*		*	*		*		*				*	*	*	*	*	*	*	*
Fabaceae	Senna	cardiosperma		P		*											*											
Fabaceae	Swainsona	canescens		P	*	*																			*			
Fabaceae	Swainsona	pterostylis		P			*																					

Family	Genus	Species	Conservation Status	Annual, Perennial or Non Native	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	x	y
Frankeniaceae	Frankenia	pauciflora var. pauciflora		P									*															
Frankeniaceae	Frankenia	setosa		P	*																							
Goodeniaceae	Brunonia	australis		P			*																					
Goodeniaceae	Dampiera	latealata		P			*																					
Goodeniaceae	Goodenia	berardiana		A			*																					
Goodeniaceae	Goodenia	concinna		P			*																					
Goodeniaceae	Scaevola	spinescens		P	*	*	*		*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Haloragaceae	Haloragis	trigonocarpa		A	*		*																					
Hemerocallidaceae	Dianella	revoluta var. divaricata		P			*																					
Lamiaceae	Prostanthera	althoferi subsp. althoferi		P			*																				*	
Lamiaceae	Prostanthera	campbellii		P			*																					
Lamiaceae	Prostanthera	grylloana		P			*																					
Lamiaceae	Westringia	rigida		P	*	*	*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Loganiaceae	Phyllangium	sulcatum		A			*																					
Malvaceae	Abutilon	cunninghamii		P	*																				*			
Malvaceae	Alyogyne	hakeifolia		P																								*
Malvaceae	Brachychiton	gregorii		P			*	*														*						
Malvaceae	Radyera	farragei		P																								*
Myrtaceae	Calothamnus	gilesii		P			*																					
Myrtaceae	Eucalyptus	campaspe		P		*														*			*					
Myrtaceae	Eucalyptus	celastroides subsp. celastroides		P	*	*						*	*			*		*		*		*		*		*		
Myrtaceae	Eucalyptus	concinna		P			*																					
Myrtaceae	Eucalyptus	gracilis		P	*						*							*		*		*	*	*	*	*	*	
Myrtaceae	Eucalyptus	griffithsii		P		*	*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Myrtaceae	Eucalyptus	lesouefii		P	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Myrtaceae	Eucalyptus	longicornis		P	*	*					*		*															
Myrtaceae	Eucalyptus	oleosa subsp. oleosa		P	*	*	*					*			*	*											*	
Myrtaceae	Eucalyptus	ravida		P	*	*				*		*	*													*		
Myrtaceae	Eucalyptus	salmonophloia		P	*			*	*	*		*														*		
Myrtaceae	Eucalyptus	salubris		P	*				*								*											
Myrtaceae	Eucalyptus	sp (sterile)		P																								*
Myrtaceae	Eucalyptus	stricklandii		P		*									*			*		*		*		*				
Myrtaceae	Eucalyptus	torquata		P	*	*									*					*	*	*	*	*	*	*	*	
Myrtaceae	Eucalyptus	transcontinentalis		P	*				*	*	*	*					*		*		*		*		*			
Myrtaceae	Eucalyptus	websteriana subsp. websteriana		P			*					*															*	
Myrtaceae	Melaleuca	eleuterostachya		P			*																					
Myrtaceae	Melaleuca	hamata		P			*																					
Myrtaceae	Melaleuca	sheathiana		P	*	*						*				*		*	*	*	*	*	*	*	*	*	*	
Pittosporaceae	Pittosporum	angustifolium		P	*		*						*									*		*				
Poaceae	Aristida	contorta		A			*						*								*		*					*
Poaceae	Austrostipa	elegantissima		P	*	*	*		*		*	*	*	*	*					*		*	*	*	*	*	*	*
Poaceae	Austrostipa	nitida		P	*	*	*			*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Family	Genus	Species	Conservation Status	Annual, Perennial or Non Native	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	x	y
Poaceae	<i>Austrostipa</i>	<i>trichophylla</i>		P		*																						
Poaceae	<i>Eragrostis</i>	<i>dielsii</i>		A			*																					
Poaceae	<i>Monachather</i>	<i>paradoxus</i>		P		*							*															
Poaceae	<i>Triodia</i>	<i>scariosa</i>		P		*									*													
Portulacaceae	<i>Calandrinia</i>	<i>eremaea sans lat</i>		A		*	*																					
Primulaceae	<i>Lysimachia</i>	<i>arvensis</i>		A, NN	*															*	*	*	*		*	*		
Proteaceae	<i>Grevillea</i>	<i>acuarua</i>		P	*	*	*	*		*	*	*								*	*	*	*		*	*		
Proteaceae	<i>Grevillea</i>	<i>nematophylla</i> subsp. <i>nematophylla</i>		P	*	*	*							*	*										*		*	
Pteridaceae	<i>Cheilanthes</i>	<i>lasiophylla</i>		P			*																					
Pteridaceae	<i>Cheilanthes</i>	<i>sieberi</i> subsp. <i>sieberi</i>		P		*	*				*																*	
Rhamnaceae	<i>Cryptandra</i>	<i>aridicola</i>		P		*	*																					
Rhamnaceae	<i>Trymalium</i>	<i>myrtillus</i> subsp. <i>myrtillus</i>		P	*	*	*				*	*			*					*	*	*			*		*	*
Rutaceae	<i>Phebalium</i>	<i>5-1</i>		P		*	*																					
Rutaceae	<i>Phebalium</i>	<i>lepidotum</i>		P																					*			
Rutaceae	<i>Phebalium</i>	<i>megaphyllum</i>		P		*									*													
Rutaceae	<i>Phebalium</i>	<i>tuberculosum</i>		P		*																						
Rutaceae	<i>Philotheca</i>	<i>brucei</i> subsp. <i>brucei</i>		P			*																					
Rutaceae	<i>Stackhousia</i>	<i>sp Mt Keith</i>		A			*			*			*															
Santalaceae	<i>Exocarpos</i>	<i>aphyllus</i>		P	*	*	*	*		*	*	*	*			*				*	*	*	*		*	*		
Santalaceae	<i>Santalum</i>	<i>acuminatum</i>		P	*	*	*			*		*	*							*		*		*	*			
Santalaceae	<i>Santalum</i>	<i>spicatum</i>		P	*	*	*	*				*		*	*	*					*				*		*	
Sapindaceae	<i>Alectryon</i>	<i>oleifolius</i>		P				*									*									*		*
Sapindaceae	<i>Dodonaea</i>	<i>adenophora</i>		P	*		*													*		*		*	*			
Sapindaceae	<i>Dodonaea</i>	<i>lobulata</i>		P	*	*	*				*			*	*						*	*		*	*			*
Sapindaceae	<i>Dodonaea</i>	<i>microzyga</i> subsp. <i>acrolobata</i>		P	*	*	*														*				*		*	*
Sapindaceae	<i>Dodonaea</i>	<i>stenozyga</i>		P		*									*										*			
Scrophulariaceae	<i>Diacirea</i>	<i>acutifolia</i>	P3	P						*					*										*			
Scrophulariaceae	<i>Eremophila</i>	<i>alternifolia</i>		P	*	*	*														*	*			*			
Scrophulariaceae	<i>Eremophila</i>	<i>caerulea</i> subsp. <i>caerulea</i>		P	*	*				*		*									*			*		*		*
Scrophulariaceae	<i>Eremophila</i>	<i>caperata</i>		P			*									*												*
Scrophulariaceae	<i>Eremophila</i>	<i>clavata</i>		P	*	*	*				*	*			*	*				*	*			*	*	*		*
Scrophulariaceae	<i>Eremophila</i>	<i>decipiens</i> subsp. <i>decipiens</i>		P	*	*	*					*		*					*	*			*	*	*			*
Scrophulariaceae	<i>Eremophila</i>	<i>georgei</i>		P		*	*								*													
Scrophulariaceae	<i>Eremophila</i>	<i>glabra</i> subsp. <i>glabra</i>		P	*	*				*			*	*			*				*			*		*		
Scrophulariaceae	<i>Eremophila</i>	<i>granitica</i>		P	*	*	*						*						*						*			
Scrophulariaceae	<i>Eremophila</i>	<i>interstans</i> subsp. <i>interstans</i>		P	*	*	*				*	*		*	*						*		*	*	*	*		*
Scrophulariaceae	<i>Eremophila</i>	<i>interstans</i> subsp. <i>virgata</i>		P	*	*	*	*		*	*		*	*							*	*	*	*	*	*		*
Scrophulariaceae	<i>Eremophila</i>	<i>ionantha</i>		P	*	*	*	*		*	*	*	*				*		*						*			
Scrophulariaceae	<i>Eremophila</i>	<i>maculata</i> subsp. <i>brevifolia</i>		P																								*
Scrophulariaceae	<i>Eremophila</i>	<i>miniata</i>		P			*							*														
Scrophulariaceae	<i>Eremophila</i>	<i>oldfieldii</i> subsp. <i>angustifolia</i>		P	*	*	*	*		*	*		*	*	*			*	*	*	*	*	*	*	*	*		*
Scrophulariaceae	<i>Eremophila</i>	<i>oppositifolia</i> subsp. <i>angustifolia</i>		P	*	*	*				*	*		*	*				*	*	*	*		*	*			*



				Annual, Perennial or Non Native	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	x	y
Family	Genus	Species	Conservation Status																									
Scrophulariaceae	Eremophila	parvifolia subsp. auricampa		P	*	*	*				*	*		*	*	*	*				*	*		*	*			
Scrophulariaceae	Eremophila	psilocalyx		P	*	*																						
Scrophulariaceae	Eremophila	scoparia		P	*	*	*	*	*	*		*	*	*	*	*	*	*			*	*			*			
Solanaceae	Duboisia	hopwoodii		P		*																						
Solanaceae	Lycium	australe		P	*			*					*												*			
Solanaceae	Solanum	centrale		P	*		*														*				*			
Solanaceae	Solanum	hoplopetalum		P		*	*																				*	
Solanaceae	Solanum	lasiophyllum		P	*	*																			*			
Solanaceae	Solanum	nummularium		P	*								*						*			*						
Solanaceae	Solanum	orbiculatum		P	*					*			*							*					*			
Solanaceae	Solanum	petrophilum		P																							*	
Solanaceae	Solanum	plicatile		P		*																						
Thymelaeaceae	Pimelea	microcephala subsp. microcephala		P			*														*					*		
Violaceae	Hybanthus	floribundus subsp. curvifolius		P		*	*																				*	
Zygophyllaceae	Zygophyllum	aurantiacum		P			*				*																	
Zygophyllaceae	Zygophyllum	compressum		A	*																							
Zygophyllaceae	Zygophyllum	eremaeum		P	*									*											*		*	
Zygophyllaceae	Zygophyllum	ovatum		A	*	*																						