



**Western  
Botanical**

Flora Survey of Battler Tenements M77/166 & P77/3645  
(Level 1 Flora Assessment and Targeted Searches)

IMD Gold Mines Ltd / Bioscope Environmental

November 2015



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33/6 Keane Street, Midland 6056  
PO Box 3608 Midland WA 6056  
T (08) 9274 0303 F (08) 9274 0136

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Client Name: IMD Gold Mines Ltd / Bioscope Environmental

Client Address: Bioscope Environmental  
East Victoria Park WA 6101  
On behalf of: IMD Gold Mines Ltd

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# 1. Introduction

## 1.1. Project Background

The Battler prospect (Battler) is located approximately 14.5 km south-southwest of Southern Cross (Figure 1). Battler is composed of two major tenements; M77/166 contains the proposed minesite and associated infrastructure, with the surrounding P77/3645 expected to experience minor (if any) impact. Previous mining has occurred within two tenements (M77/1025 and M77/1044) that occur within M77/166. For the purposes of this survey and report, these historical tenements are treated as part of M77/166.

IMD Gold Mines Ltd is investigating the potential for further mining at Battler and contracted Bioscope Environmental (Bioscope) to manage the mining approvals process. Bioscope initially contracted Western Botanical to conduct a Level 1 flora and vegetation survey of Battler, conducted 29<sup>th</sup> September to 1<sup>st</sup> October 2015, in accordance with Guidance Statement 51 (EPA 2004). An additional focus of the survey was to map, quantify, and assess the regional distribution of the Priority 2 species *Acacia concolorans* previously recorded at Battler.

Identification of collected specimens from this initial survey revealed the existence of additional priority species at Battler. A second field survey was performed during 21<sup>st</sup> – 23<sup>rd</sup> October 2015 to map and quantify these additional priority species.

## 1.2. Previous Surveys of Battler

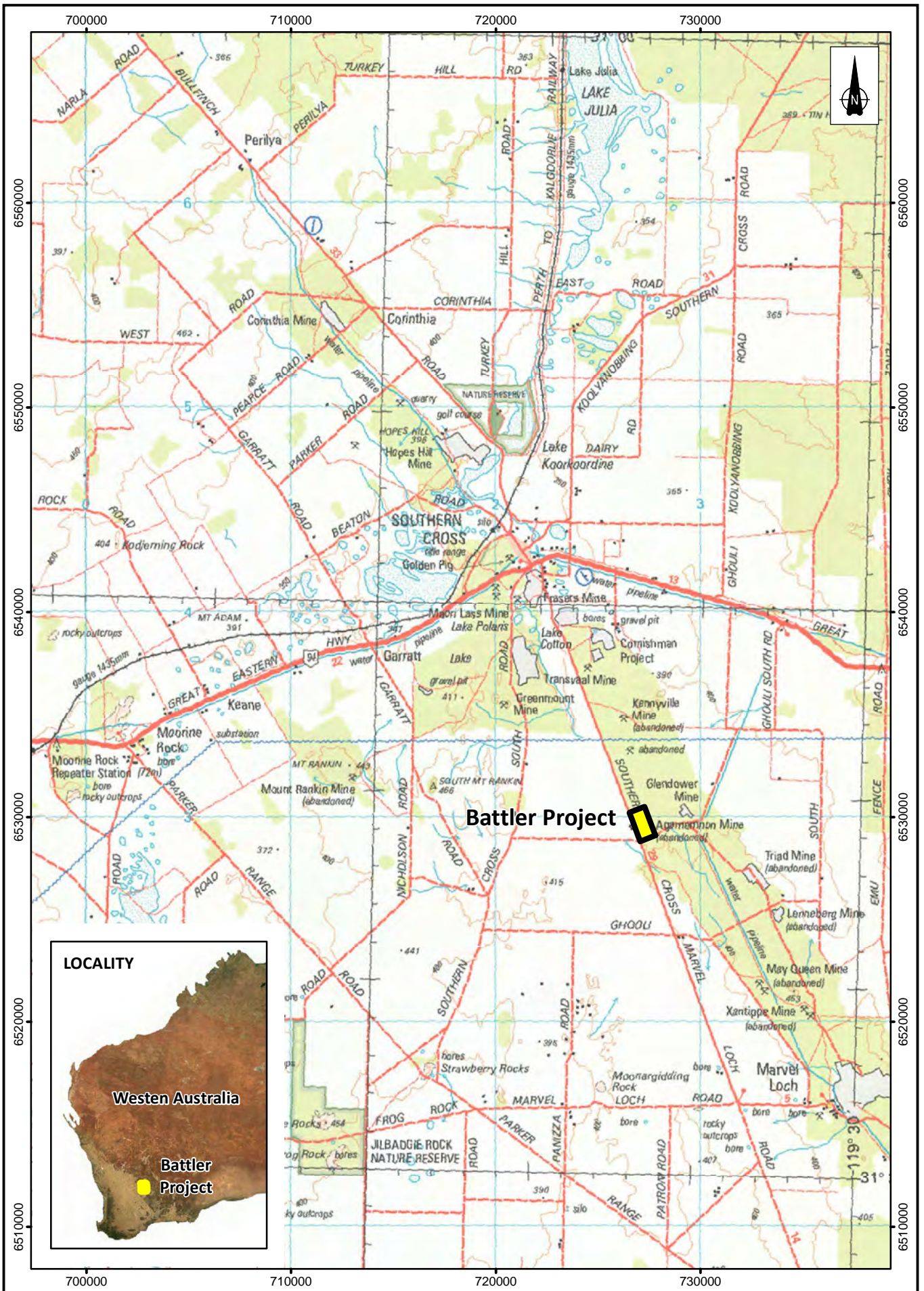
Botanica Consulting (2011) (Botanica) conducted a Level 1 flora and vegetation survey of the Battler site in 2010. Botanica reported two vegetation communities comprising of 50 flora taxa, including the Priority 2 species *Acacia concolorans* and three weeds (*Carrichtera annua*, *Medicago minima*, and *Centaurea melitensis*).

Though not encountered within the Botanica survey a DEC (Department of Environment and Conservation) record of the Priority 1 species *Goodenia heatheriana* was reported as being within the project area. Additionally, the Botanica report highlighted the potential for Priority 1 species *Millotia newbeyi* to be within the Battler project area.

As part of the 2011 survey, Botanica conducted searches of DEC/DpAW databases and found no Threatened or Priority Ecological Communities, no Threatened flora (Declared Rare Flora), and no Ecologically Sensitive Areas at Battler.

**Figure 1. Location of the Battler project in relation to Southern Cross, Western Australia.**





0 1 2 3 4 5 km  
 Scale: 1:250,000  
 GDA 1994 MGA Zone 50  
 CAD Ref: g2361\_F001  
 Date: December 2015

**Western Botanical**  
 Author: Western Botanical | WB Ref:  
 Drawn: CAD Resources - www.cadresources.com.au  
 Tel: (08) 9246 3242 - Fax (08) 9246 3202

**IMD Gold Mines Ltd**  
**Location**  
**Battler Project**

Figure:

## 2. Methods

### 2.1. Desktop Assessment

To gather background information and to enhance field team member knowledge of Battler's local flora, the following sources were accessed prior to fieldworks:

- A NatureMap (Government of Western Australia 2015a) search results for records of flora occurring within 20 km of Battler.
- DPaW TEC and PEC descriptions (DPaW 2015).
- Botanica Consulting (2011). *Level 1 Flora and Vegetation Survey: Battler*. Consultant report prepared for Southern Cross Goldfields Ltd.
- Bureau of Meteorology online climate data (BOM 2015).
- FloraBase location records of priority flora expected to be encountered.
- The Western Australian Herbarium reference and research flora specimen collections.

### 2.2. Field Survey

Two spring fieldtrips (29<sup>th</sup> September – 1<sup>st</sup> October and 21<sup>st</sup> – 23<sup>rd</sup> October) were conducted as part of the survey, both consisting of the same two senior botanists (Section 5.0).

The first day of survey (29<sup>th</sup> September) was devoted to visiting and quantifying known populations of *Acacia concolorans* (P1) to the south of Battler. This regional work was invaluable to the field team's knowledge of the taxon and the team's ability to confirm/repudiate the previous record of *A. concolorans* at Battler.

The remainder of the first fieldtrip was spent surveying Battler by walking individual transects; spaced 25 m apart on tenement M77/166, and 50 m apart on the remainder untraversed portions of tenement P77/3645.

Changes in vegetation associations were waypointed using GPS units (Garmin GPSmap76 ± 5 m accuracy) to assist placement of vegetation map boundaries. Relevés were conducted for newly encountered vegetation associations and periodically conducted to verify or modify re-encountered associations. Specimens were taken for most flora encountered (excluding very obvious taxa) to ensure priority species were not overlooked and to help form a full species list for the Battler project.

The second fieldtrip focused on targeted searching for priority species identified subsequent to the first survey and during the second fieldtrip; *Hydrocotyle corynophora* (P1), *Goodenia heatheriana* (P1), *Gnephosis intonsa* (P3), and *Phlegmatospermum eremaeum* (P3). Plant numbers of these annuals were estimated using a combination of 'extrapolated count' and 'estimate' methods (as per DEC n.d.). Since all target priority species were annuals occurring in wet depressions, the search was heavily focused on areas of Battler where such habitat occurs.



Additionally, searches were conducted outside of and adjacent to Battler in areas most likely containing suitable habitat.

### **2.3. Flora Specimen Identification**

Flora specimens collected during fieldworks were identified using the resources of Western Botanical's herbarium and the Western Australian Herbarium. Mike Hislop and Rob Davis of the Western Australian Herbarium performed confirmation of identification for specimens of key importance to the Battler project; *Goodenia heatheriana*, *Hemigenia* sp. Newdegate (E. Bishop 75), *Hydrocotyle corynophora*, and *Teucrium* sp. dwarf (R. Davis 8813).

### 3. Results and Discussion

#### 3.1. Biogeography

Battler is located within the Coolgardie region and Southern Cross (COO2) subregion as described by the Interim Biogeographic Regionalisation for Australia system. The subregion is characterised by gently undulating uplands dissected by broad valleys with bands of low greenstone hills (Cowan *et al.* 2001). Vegetation of COO2 includes *Eucalyptus* woodlands (*Eucalyptus salmonophloia*, *E. salubris*, *E. transcontinentalis*, *E. longicornis*) with granite basement outcrops supporting stands of *Acacia acuminata* and *E. loxophleba* (Cowan *et al.* 2001).

Battler lies just within the western portion of the Great Western Woodlands area as defined within DEC 2010. The Great Western Woodlands covers an area of almost 16 million hectares and is considered the largest remaining area of intact Mediterranean woodland (DEC 2010).

Priority Ecological Communities of relevance or close proximity to Battler include (DPaW 2015):

- Red Morrel Woodlands of the Wheatbelt – Unspecified locations within the Wheatbelt DPaW regional boundary.
- Parker Range Vegetation Complex – Approximately 35 km SE of Battler.
- Eucalypt Woodlands of the Western Australian Wheatbelt. Within Avon Wheatbelt IBRA region, approximately 12 km west of Battler.

Results of the NatureMap search (Appendix 1) found 475 flora taxa within 20 km of Battler, including two Threatened (Declared Rare Flora) species (*Daviesia microcarpa*, *Eucalyptus crucis* subsp. *crucis*) and 20 Priority species.

Rainfall data (BOM 2015) for nearby Southern Cross Airport shows an above average season for the Battler during the year previous to the survey (Figure 2). Total rainfall for the previous 12 months was 368.8 mm compared to the historical mean of 305.6 mm. Rainfall in August prior to the survey was 2.73 times the historical mean.

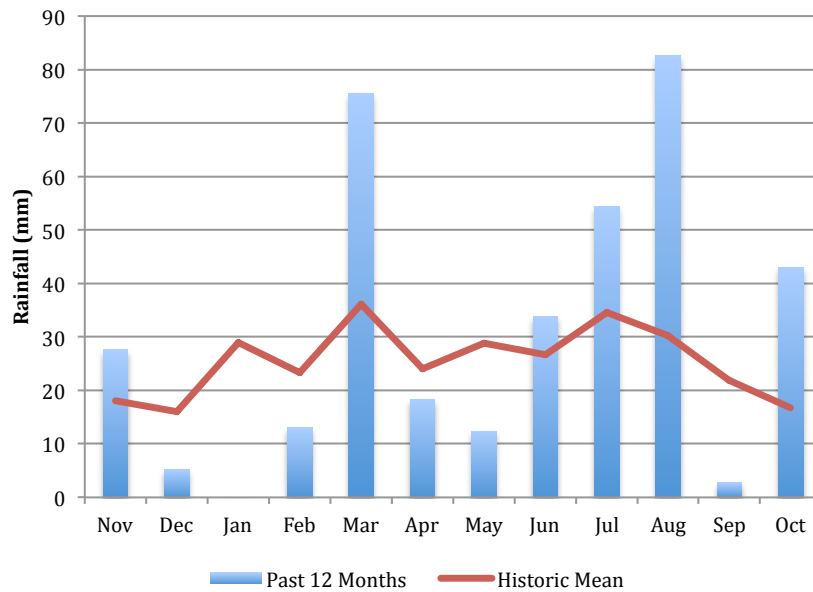


Figure 2. Recent and historical mean rainfall recorded at Southern Cross Airport (BOM 2015).

### 3.2. *Acacia concolorans* Regional Survey

Western Botanical botanists conducted a regional survey of known *Acacia concolorans* (P2) locations up to approximately 100 km south of Battler in order to address uncertainty over its presence at Battler. Attempts were made to visit seven of the nine known locations, with five being visited due to access limitations. *Acacia concolorans* plants (Plate 1) were found in abundance and widely distributed at two of the five visited locations. This survey resulted in improved familiarity with the taxon and confirmed identity differentiation from other closely related *Acacia* species. *Acacia concolorans* differs from *A. intricata* in having a smaller and more upright habit, thicker and more robust branches, and sparser phyllodes that are associated with strong pungent stipules.

At Battler, the three locations of *A. concolorans* reported by Botanica (2011) were revisited. Despite searching at and around these locations, no plants of *A. concolorans* were found. Additionally, no *A. concolorans* plants were encountered at or near Battler by Western Botanical during the survey works. However, all three previously reported locations of *A. concolorans* did contain numerous plants of *A. intricata*, a species similar in appearance. It is therefore likely that the previously reported occurrences of *A. concolorans* at Battler were due to misidentification of *A. intricata*.



**Plate 1. Examples of *Acacia concolorans* plants encountered during regional survey.**

### **3.3. Vegetation Mapping**

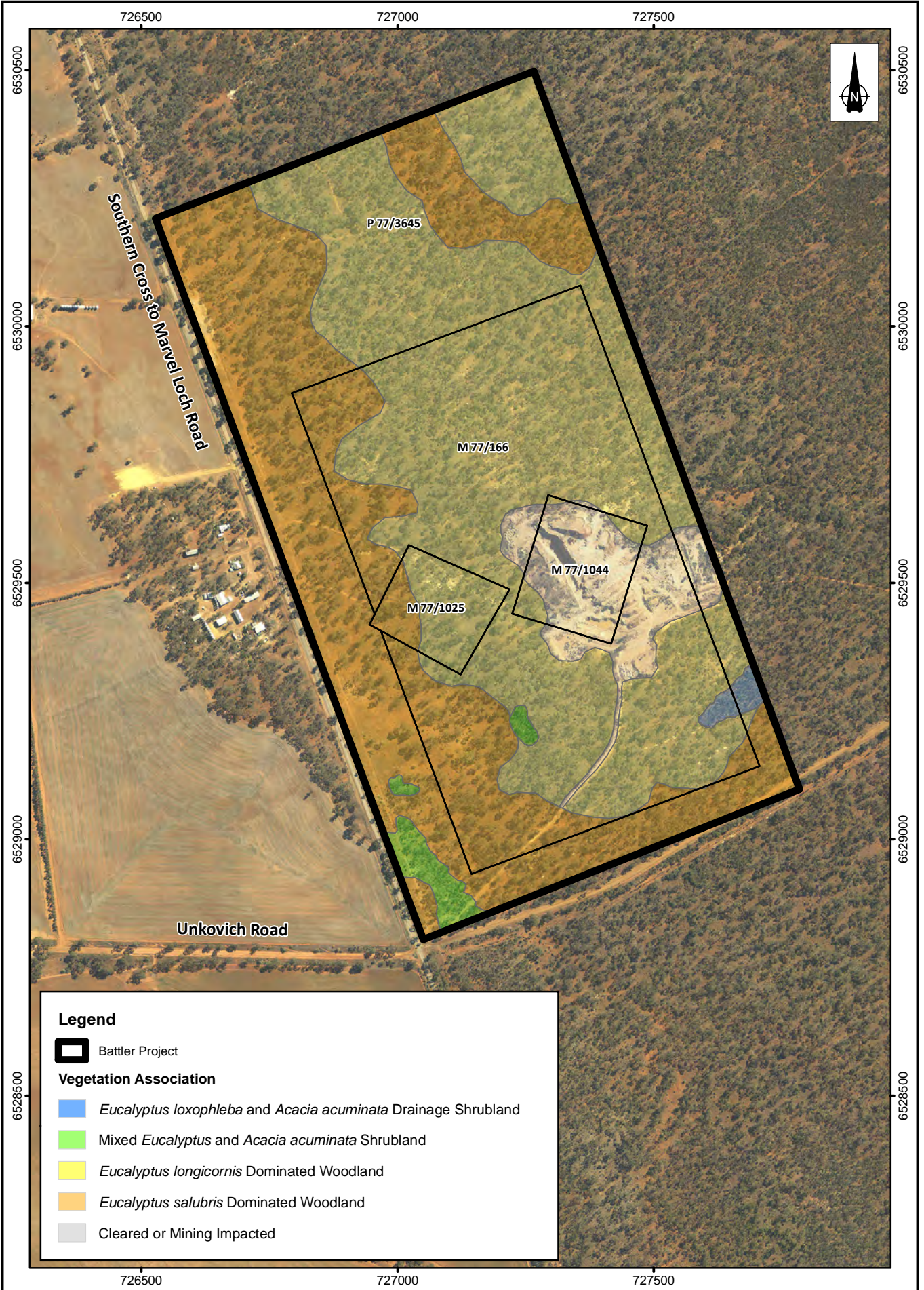
The vegetation map of Battler resulting from the field survey is presented in Figure 3. The five vegetation associations (one representing mined and/or cleared areas) below were identified and are described in detail within the following headings.

- *Eucalyptus longicornis* Dominated Woodland
- *Eucalyptus salubris* Dominated Woodland
- *Eucalyptus loxophleba* & *Acacia acuminata* Drainage Shrubland
- Mixed *Eucalyptus* & *Acacia acuminata* Shrubland
- Cleared or Mining Impacted

The two major vegetation associations at Battler, ‘*Eucalyptus longicornis* Dominated Woodland’ and ‘*Eucalyptus salubris* Dominated Woodland’ continue and extend outside of the Battler project area and appear common in the local region.



**Figure 3. Vegetation Map of Battler project and surrounds.**



**Legend**

Battler Project

**Vegetation Association**

- Eucalyptus loxophleba* and *Acacia acuminata* Drainage Shrubland
- Mixed *Eucalyptus* and *Acacia acuminata* Shrubland
- Eucalyptus longicornis* Dominated Woodland
- Eucalyptus salubris* Dominated Woodland
- Cleared or Mining Impacted

0 100 200 m  
 Scale: 1:10,000  
 GDA 1994 MGA Zone 50



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**IMD Gold Mines Ltd  
 Vegetation Associations  
 Battler Project**

Figure:

CAD Ref: g2361\_F002  
 Date: December 2015 | Rev: A | A4



### 3.3.1. *Eucalyptus longicornis* Dominated Woodland

*Eucalyptus longicornis* (dominant), *E. salubris*, and *E. calycogona* subsp. *calycogona* open woodland from 6 to 15 m over *Melaleuca pauperiflora* subsp. *fastigiata* and *Santalum apiculatum* sparse tall shrubland from 3 to 4 m over *Eremophila scoparia*, *Atriplex vesicaria*, *A. bunburyana* open shrubland from 0.6 to 1.5 m over *Maireana georgei*, *Enchylaena tomentosa*, *Zygophyllum* spp. sparse low shrubland (Plate 2).

*Eucalyptus longicornis* Dominated Woodland is widespread at Battler, occurring on higher flat areas and associated long gentle slopes. Higher in the landscape than the *Eucalyptus salubris* Dominated Woodland (see next entry), this association is drier and contains fewer wet depressions and lower densities of annuals and weeds.

The priority three species *Phlegmatospermum eremaeum* was recorded within this vegetation association at one isolated location just outside the boundary of tenement M77/166 (see Section 3.5).



Plate 2. Examples of *Eucalyptus longicornis* Dominated Woodland vegetation association.

### 3.3.2. *Eucalyptus salubris* Dominated Woodland

*Eucalyptus salubris* (dominant), *E. calycogona* subsp. *calycogona*, and *E. longicornis* open woodland from 6 to 15 m over *Exocarpos aphyllus*, *Atriplex nummularia* isolated shrubs from 2 to 3 m over *A. vesicaria*, *Ptilotus* sp. Goldfields (R. Davis 10796), *Zygophyllum apiculatum* (with *Acacia erinacea*, *A. merrallii*, *A. intricata* in southern areas) sparse shrubland (Plate 3).

Being lower in the landscape this vegetation association contains frequent wet depressions that support a host of annual species, commonly including; *Gnephosis intonsa* (P3), *Goodenia pinnatifida*, *Rhodanthe chlorocephala* subsp. *rosea*, *Leucochrysum fitzgibbonii*, and *Podolepis capillaris*. Some localised wet depressions within this vegetation association were found to support *Hydrocotyle corynophora* (P1) and *Goodenia heatheriana* (P1).

Weeds were common within this association at the time of the survey, particularly toward the western boundary in closer proximity to farmland. Of the weeds *Carrichtera annua* (Wards Weed) was most prevalent in dense patches within wet depressions. Other weeds scattered in low densities included; *Brassica tournefortii* (Mediterranean Turnip), *Arctotheca calendula* (Cape Weed), *Medicago minima* (Small Burr medic), *Centaurea melitensis* (Maltese Cockspur), *Sonchus oleraceus* (Common Sowthistle), and *Avena barbata* (Bearded Oat).





**Plate 3. Examples of *Eucalyptus salubris* Dominated Woodland vegetation association.**

### **3.3.3. *Eucalyptus loxophleba* & *Acacia acuminata* Drainage Shrubland**

Emergent *Eucalyptus loxophleba* subsp. *lissophloia* (6 to 10 m) over *Acacia acuminata* (3 to 4 m) tall shrubland over *Beyeria sulcata*, *Alyxia buxifolia*, *Philotheca brucei* open shrubland (2 to 3 m), over a very sparse ground layer of *Podolepis lessonii* and *Trachymene cyanopetala* (Plate 4).

This vegetation association is restricted to one area located toward the south-eastern portion of Battler. It represents a reasonably large internal drainage area that is likely seasonably inundated.

No priority species or weed species were recorded within this association at the time of survey.



**Plate 4. Examples of *Eucalyptus loxophleba* & *Acacia acuminata* Drainage Shrubland vegetation association.**

### **3.3.4. Mixed *Eucalyptus* & *Acacia acuminata* Shrubland**

*Eucalyptus corrugata*, *E. yilgarnensis*, and *E. oleosa* subsp. *oleosa* open woodland (6 to 10 m) over *Acacia acuminata* (3 to 4 m) tall shrubland over *Hybanthus floribundus*, *Beyeria sulcata*, *Trymalium myrtillus* subsp. *myrtillus* shrubland (0.6 to 2.5 m) over *Lepidosperma* aff. *fimbriatum* (species of interest) sparse sedgeland (Plate 5).

This vegetation association occurs on the low hill rise within the south-western portion of the project area with a disjunct patch occurring on an small isolated rise further toward the centre of the project area.

The Priority 1 species *Hemigenia* sp. Newdegate and the species of interest *Lepidosperma* aff. *fimbriatum* both appear restricted to this vegetation association. In the case of *H.* sp. Newdegate,



its identity was not determined until after the second field survey and it may therefore be more abundant within this vegetation association than currently reported.



**Plate 5. Examples of Mixed *Eucalyptus* & *Acacia acuminata* Shrubland vegetation association.**

### **3.3.5. Cleared or Mining Impacted**

This association is represented by the historical mine and associated vehicle tracks. These areas have had most native vegetation previously removed with some natural revegetation subsequently occurring across the historical mine (primarily chenopods of *Atriplex* spp., *Sclerolaena* spp. and *Enchylaena tomentosa*). Common weeds within this association include *Hordeum leporinum* (Barley grass) throughout, *Moraea setifolia* along vehicle tracks, and infrequently scattered *Arctotheca calendula* (Cape weed).

### **3.4. Overview of Flora**

A total of 140 flora taxa were recorded during the survey effort, comprising of 36 families, 92 genera and 140 species. A full species list is presented in Appendix 2. The survey season quality was considered excellent with an unexpectedly high number of species recorded for Battler's small project area. Family Asteraceae was represented by 26 taxa (18% of flora), followed by Chenopodiaceae with 17 taxa (12% of flora) and Fabaceae with 15 taxa (11% of flora).

No Threatened (Declared Rare Flora) were found at or adjacent to Battler. Five priority species were found, including three Priority 1 and two Priority 3 species. An additional Priority 1 species was found outside of Battler approximately 1 km to the east. One species of interest (due to unresolved taxonomy) was also found at Battler. Sixteen weed species were recorded during the survey.

Three specimens could not be identified due to insufficient material (*Acacia* sp. Indeterminate, *Swainsona* sp. Indeterminate, and *Thysanotus* sp. Indeterminate). It is unlikely that any of these three specimens are Threatened or Priority flora. No priority species of *Swainsona* or *Thysanotus* were listed by the NatureMap search (Appendix 1). Likewise, *Acacia* sp. Indeterminate does not resemble any of the priority species listed by the NatureMap search (Appendix 1).

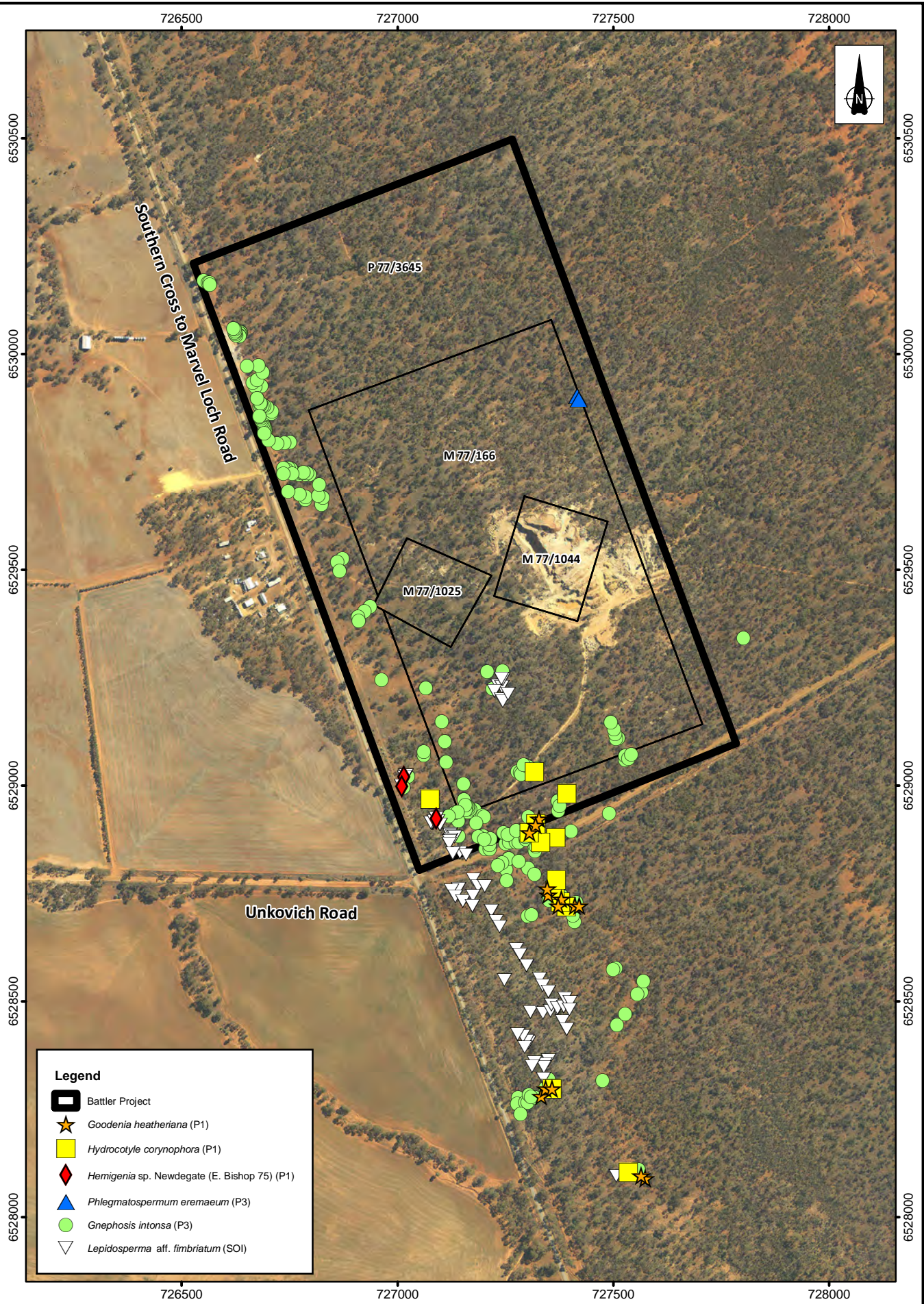
Both significant flora and weeds are addressed in their separate sections below.

### **3.5. Significant Flora**








Recorded significant flora locations within and adjacent to Battler are presented in Figure 4 with all coordinates and plant count data presented in Appendix 3. Table 1 summarises the percentages of significant flora recorded within and outside of the Battler project area.



**Figure 4. Map of significant flora (Priority and of interest) locations recorded at and adjacent to Battler.**



**Legend**

-  Battler Project
-  *Goodenia heatheriana* (P1)
-  *Hydrocotyle corynophora* (P1)
-  *Hemigenia* sp. Newdegate (E. Bishop 75) (P1)
-  *Phlegmatospermum eremaeum* (P3)
-  *Gneposis intonsa* (P3)
-  *Lepidosperma* aff. *fimbriatum* (SOI)

0 100 200 m  
 Scale: 1:12,000  
 GDA 1994 MGA Zone 50

CAD Ref: g2361\_F003  
 Date: December 2015

Rev: A | A4

 **Western Botanical**

Author: Western Botanical | WB Ref:  
 Drawn: CAD Resources ~ www.cadresources.com.au  
 Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

**IMD Gold Mines Ltd**  
**Significant Flora**  
**Battler Project**

Figure:



**Table 1. Summary of significant flora counts and locations in relation to major tenements of Battler. Section 1: presence within and outside of tenement M77/166. Section 2: presence within M77/166, within P77/3645, and outside of P77/3645.**

SECTION 1: Presence within and outside of tenement M77/166.								
Species	Status	Plants within M77/163		Plants outside M77/163		Total Plants Recorded		
<i>Hydrocotyle corynophora</i>	P1	115	(5.44%)	2,000	(94.56%)	2,115		
<i>Goodenia heatheriana</i>	P1	0	(0.00%)	5,530	(100%)	5,530		
<i>Hemigenia</i> sp. Newdegate (E. Bishop 75)	P1	0	(0.00%)	15	(100%)	15		
<i>Teucrium</i> sp. dwarf (R. Davis 8813)	P1	0	(0.00%)	1	(100%)	1		
<i>Gnephosis intonsa</i>	P3	4325	(7.93%)	50,185	(92.07%)	54,510		
<i>Phlegmatospermum eremaeum</i>	P3	44	(100%)	00	(0.00%)	44		
<i>Lepidosperma</i> aff. <i>fimbriatum</i>	SOI	17	(1.05%)	1,601	(98.95%)	1,618		
Section 2: Presence within, M77/166, within P77/3645, and outside of P77/3645.								
Species	Status	Plants within M77/163		Plants within P77/3645 (excl.)		Plants outside P77/3645		Total Plants Recorded
<i>Hydrocotyle corynophora</i>	P1	115	(5.44%)	103	(4.87%)	1,897	(89.69%)	2,115
<i>Goodenia heatheriana</i>	P1	0	(0.00%)	10	(0.18%)	5,520	(98.82%)	5,530
<i>Hemigenia</i> sp. Newdegate (E. Bishop 75)	P1	0	(0.00%)	15	(100%)	0	(0.00%)	15
<i>Teucrium</i> sp. dwarf (R. Davis 8813)	P1	0	(0.00%)	0	(0.00%)	1	(100%)	1
<i>Gnephosis intonsa</i>	P3	4325	(7.93%)	27,201	(49.90%)	22,984	(42.16%)	54,510
<i>Phlegmatospermum eremaeum</i>	P3	44	(100%)	0	(0.00%)	0	(0.00%)	44
<i>Lepidosperma</i> aff. <i>fimbriatum</i>	SOI	17	(1.05%)	151	(9.33%)	1,450	(89.62%)	1,618



### 3.5.1. *Hydrocotyle corynophora* (Priority 1)

*Hydrocotyle corynophora* is a sprawling rosetted annual (Plate 6) that inhabits wet depressions and wetter flat areas. Prior to Western Botanical's *H. corynophora* was known only from a single collection in 1896 from an uncertain location. The records within and south of Battler currently represent the only known locations of this poorly known species. The conservation status of *H. corynophora* may be upgraded by DPaW from Priority 1 to Threatened due to its recent re-discovery.

One hundred and fifteen plants of *H. corynophora* were found at a single location within the south of tenement M77/166. One hundred and three plants were found at three locations within tenement P77/3645. A further 1,897 plants were found south of the Battler project.

As *H. corynophora* is restricted to wet depressions and wetter flat areas, alteration of surface hydrology may impact on this poorly understood species.



**Plate 6. Photos of *Hydrocotyle corynophora* (P1) showing growth habit and inflorescence.**

### 3.5.2. *Goodenia heatheriana* (Priority 1)

*Goodenia heatheriana* is a sprawling rosette annual herb growing to 15 cm high (Plate 7). It is known from six locations within records of the Western Australian Herbarium (1998-), highly restricted to a small geographic area within the Coolgardie IBRA region. It is distinguished from other similar *Goodenia* species by its distinctive glandular hairs on the abaxial surface of petals.

No *Goodenia heatheriana* plants were recorded within tenement M77/166. Ten plants at one location were recorded just within the southern boundary of tenement P77/3645. A further 5,520 plants were recorded adjacent and south of Battler, typically in wet depressions on lower slopes and low hilltops.



**Plate 7. Photos of *Goodenia heatheriana* (P1) showing glandular hairs on flower (at bottom of petal) and divided rosette leaves.**

### 3.5.3. *Hemigenia* sp. Newdegate (E. Bishop 75) (Priority 1)

*Hemigenia* sp. Newdegate is a low shrub growing to 45 cm with bright blue/purple flowers (Plate 8). It is known from five locations within records of the Western Australian Herbarium (1998-), restricted to the southwest portion of Coolgardie and western portion of Mallee IBRA regions.

Fifteen plants were recorded at Battler within the southwest corner of tenement P77/3645, with all plants confined to the 'Mixed *Eucalyptus* & *Acacia acuminata* Shrubland' vegetation association. The identity of this species was not known until after the field surveys, and may therefore be more abundant within this vegetation association than currently reported.



**Plate 8. Photo of *Hemigenia* sp. Newdegate (E. Bishop 75) (P1) showing habit and bright blue/purple flowers.**

### 3.5.4. *Teucrium* sp. dwarf (R. Davis 8813) (Priority 1)

*Teucrium* sp. dwarf (R. Davis 8813) is a compact dwarf shrub to 15 cm high (Plate 9). Within records of the Western Australian Herbarium (1998-) it is known from three locations and restricted to the south of the Coolgardie IBRA region.

One record of *Teucrium* sp. dwarf was recorded approximately 1 km east of Battler (GDA 94, 50 J 0728615 6529357) during priority species searches. No plants of *T.* sp. dwarf were found within or immediately adjacent to Battler.





**Plate 9. Scan of the collected *Teucrium* sp. dwarf (R. Davis 8813).**

### **3.5.5. *Gnephosis intonsa* (Priority 3)**

*Gnephosis intonsa* is a grey-white, prostrate to ascending annual herb typically growing to 4 cm but notably higher with good rainfall (Plate 10). Within records of the Western Australian Herbarium (1998-) it is widely distributed within the Coolgardie IBRA region and known within the Murchison, Mallee, and Esperance Plains regions.

The field surveys found that *Gnephosis intonsa* is widespread and very abundant within wet depressions of the ‘*Eucalyptus salubris* Dominated Woodland’ vegetation association, both within Battler and the surrounding area.



**Plate 10. Photos of *Gnephis intonsa* (P3) showing a single plant and multiple plants within wet depression.**

### **3.5.6. *Phlegmatospermum eremaeum* (Priority 3)**

*Phlegmatospermum eremaeum* is a prostrate to spreading annual herb typically growing to 10 cm high (Plate 11). It is widely but sparsely distributed across semi-arid areas of southern Western Australia (Western Australian Herbarium 1998-).

At Battler forty-four plants were recorded at one location (two patches) immediately inside the northern portion of tenement M77/166's eastern boundary, within the '*Eucalyptus longicornis* Dominated Woodland' vegetation association. Due to GPS error ( $\pm 5$  m) it is possible the plants may be outside M77/166 and within P77/3645. Where found, it grew within one metre of a eucalypt tree trunk. Priority searching at and around the known location and within the vegetation association did not find additional plants.



**Plate 11. Photo of dense patch of *Phlegmatospermum eremaeum* (P3) in litter under eucalypts.**

### **3.5.7. *Calotis erinacea* (Species of Interest)**

*Calotis erinacea* is a branched, straggling perennial herb growing to height (length) of 0.8 m. This species is common and widespread, inhabiting most of inland Australia, extending south into Victoria, and also with a disjunct presence in the South West of Western Australia. It is considered a Species of Interest due to the record at Battler representing a 250 km range extension from populations previously recorded in the South West of Western Australia. While a specimen was collected at Battler, the overall distribution within the project area was not assessed.

### **3.5.8. *Lepidosperma* aff. *fimbriatum* (Species of Interest)**

*Lepidosperma* aff. *fimbriatum* is a strap-leaved sedge growing to 45 cm (Plate 12). It is considered a Species of Interest due to unresolved taxonomy, having affinity to both *L. diurnum* and *L. fimbriatum*. Though matching specimens are held within Western Australian Herbarium, this taxon is not currently formally recognised within Western Australia's Census of Vascular Flora, and thus is not a priority species.

At Battler it is restricted to the 'Mixed *Eucalyptus* & *Acacia acuminata* Shrubland' vegetation association for which it is a characteristic species of the ground layer. Additionally, this *Lepidosperma* was found in relatively high numbers south of the Battler project.





**Plate 12. Scan of *Lepidosperma* aff. *fimbriatum* (Species of Interest) and photo showing growth habit at bottom right.**

### 3.6. Weeds

Sixteen weed species were recorded during the survey. None of these weed species are listed as a Declared Pest in Western Australia and none are listed as a Weed of National Significance (Government of Western Australia 2015b, Australian Weeds Committee 2015).

The majority of weed species were encountered infrequently and were sparsely distributed within Battler. Generally, weeds were more abundant along the western side of the project area (likely due to proximity to farmland west of Forrestiana-Southern Cross Road). Table 2 presents a summary of the more frequently encountered weed species and their abundance and distribution at Battler.

Of the weeds, *Carrichtera annua* was the most widespread and abundant, frequently occurring within wet depressions and other wetter areas or the two *Eucalypt* woodland vegetation associations.

**Table 2. Summary of key weed species (more abundant) recorded at Battler.**

Weed Species Name	Distribution and Abundance Notes
<i>Brassica tournefortii</i>	Common but sparsely distributed as isolated plants throughout Battler, with increased density toward the western third of the project area.
<i>Carrichtera annua</i>	Common and often dominant in wet depressions throughout Battler. More frequently found in the <i>Eucalyptus salubris</i> dominated woodland where wet depressions are more abundant and along drainage lines associated with roads and tracks.
<i>Centaurea melitensis</i>	Small isolated patches scattered within the <i>Eucalyptus salubris</i> dominated woodland along the western boundary of Battler.
<i>Hordeum leporinum</i>	Common within areas heavily disturbed by historical mining. Some infrequent occurrences on/near the powerline track along the western boundary of Battler.
<i>Moraea setifolia</i>	Common along tracks and ditches within and around areas heavily disturbed by historical mining.

### 3.7. Vegetation Condition

The overall vegetation condition for Battler is considered 'Good' on the Keigheri Condition Scale (see Appendix 4) due to the presence of weeds and disturbance from previous mining. The north-northeastern quarter of Battler area approaches a condition of 'Very Good', containing fewer weeds than the remainder of the project area. The historically mined areas previously cleared of most vegetation and mined are considered 'Completely Degraded', containing little of the original vegetation and significant weed coverage.

### 3.8. Limitations

Western Botanical notes the following limitations for the Level 1 survey of the Battler project:

- While the spacing of transects and resolution of targeted searching conducted is considered high intensity for a Level 1 survey, some occurrences/locations of priority species may still remain unrecorded.
- Plant counts for significant flora are to be considered estimates, particularly for annual species where large numbers were present.
- The detection of *Goodenia heatheriana* during the second fieldtrip (20 days after the first fieldtrip when it was not yet flowering) highlights the importance of timing for botanical surveys. Though the surveys performed were fairly comprehensive, it is still possible that other species remain undetected due to timing of fieldtrips.
- Previous mining activity and refuse heaps provided a hazard for botanists during the survey and prevented some small areas from being fully surveyed. Such areas were typically heavily disturbed and unlikely to contain priority flora.
- For the majority of the survey the accuracy of GPS units used was consistently noted at  $\pm 5$  m. However, reduced accuracy (to  $\pm 30$  m) and jumping/shifting location on GPS displays was observed in some areas of Battler that contained moderate slopes and/or denser tree coverage.

## 4. References

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## 5. List of Participants

<b>Role</b>	<b>Participant</b>	<b>Relevant Licenses</b>
Project Manager / Senior Botanist	Dr David Leach	SL011550
Project Manager / Senior Botanist	Jonathan Warden	SL011549

## **Appendix 1. NatureMap Flora Search Results.**

# Battler NatureMap Species Report

Created By Guest user on 18/09/2015

Kingdom Plantae  
Current Names Only Yes  
Core Datasets Only Yes  
Method 'By Circle'  
Centre 119°24' 28" E,31°20' 38" S  
Buffer 20km

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
1.	14048 <i>Acacia ancistrophylla</i> var. <i>perarcuata</i>		P3	
2.	3218 <i>Acacia anfractuosa</i>			
3.	14052 <i>Acacia asepala</i>		P2	
4.	15467 <i>Acacia assimilis</i> subsp. <i>assimilis</i>			
5.	3236 <i>Acacia beauverdiana</i> ( <i>Pukkati</i> )			
6.	3251 <i>Acacia camptoclada</i>			
7.	3264 <i>Acacia colletioides</i> ( <i>Wait-a-while</i> )			
8.	14618 <i>Acacia concolorans</i>		P2	
9.	16117 <i>Acacia consanguinea</i>			
10.	3269 <i>Acacia coolgardiensis</i> ( <i>Spinifex Wattle</i> )			
11.	14623 <i>Acacia crenulata</i>		P3	
12.	16169 <i>Acacia deficiens</i>			
13.	14069 <i>Acacia desertorum</i> var. <i>nudipes</i>		P3	
14.	16119 <i>Acacia dissona</i> var. <i>dissona</i>			
15.	12257 <i>Acacia enervia</i> subsp. <i>explicata</i>			
16.	3337 <i>Acacia filifolia</i>		P3	
17.	15282 <i>Acacia gibbosa</i>			
18.	3366 <i>Acacia hemiteles</i>			
19.	15285 <i>Acacia heteroneura</i> var. <i>jutsonii</i>			
20.	3378 <i>Acacia inaequiloba</i>			
21.	3389 <i>Acacia intricata</i>			
22.	3393 <i>Acacia jennerae</i>			
23.	14610 <i>Acacia kalgoorliensis</i>			
24.	3426 <i>Acacia longispinea</i>			
25.	3440 <i>Acacia merrallii</i>			
26.	3451 <i>Acacia multispicata</i>			
27.	3452 <i>Acacia murrayana</i> ( <i>Sandplain Wattle</i> )			
28.	15290 <i>Acacia neurophylla</i> subsp. <i>erugata</i>			
29.	15479 <i>Acacia nigripilosa</i> subsp. <i>nigripilosa</i>			
30.	3463 <i>Acacia nyssophylla</i>			
31.	3494 <i>Acacia poliochroa</i>			
32.	3495 <i>Acacia prainii</i> ( <i>Prairie's Wattle</i> )			
33.	3512 <i>Acacia rendlei</i>			
34.	3513 <i>Acacia resinimarginea</i>			
35.	3524 <i>Acacia rossei</i>			
36.	15484 <i>Acacia sphacelata</i> subsp. <i>sphacelata</i>			
37.	3555 <i>Acacia steedmanii</i>			
38.	23525 <i>Acacia steedmanii</i> subsp. <i>steedmanii</i>			
39.	16157 <i>Acacia xerophila</i> var. <i>brevior</i>			
40.	15292 <i>Acacia yorkrakinensis</i> subsp. <i>acrita</i>			
41.	31602 <i>Acrotriche lancifolia</i>			
42.	7817 <i>Actinobole uliginosum</i> ( <i>Flannel Cudweed</i> )			
43.	6208 <i>Actinotus superbus</i>			
44.	1770 <i>Adenanthos argyreus</i> ( <i>Little Woollybush</i> )			
45.	1720 <i>Allocasuarina acutivalvis</i>			
46.	1722 <i>Allocasuarina corniculata</i>			
47.	12655 <i>Allocasuarina spinosissima</i>			
48.	6565 <i>Alyxia buxifolia</i> ( <i>Dysentery Bush</i> )			
49.	40903 <i>Androcalva aphrix</i>			
50.	7836 <i>Angianthus tomentosus</i> ( <i>Camel-grass</i> )			
51.	17963 <i>Aotus tietkensis</i>			
52.	1364 <i>Asphodelus fistulosus</i> ( <i>Onion Weed</i> )	Y		



Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
53.	7846 <i>Asteridea athrioides</i>			
54.	6336 <i>Asteroloma serratifolium</i> (Kondrung)			
55.	20726 <i>Astus subroseus</i>			
56.	11435 <i>Atriplex acutibractea</i> subsp. <i>acutibractea</i>			
57.	11489 <i>Atriplex acutibractea</i> subsp. <i>karoniensis</i>			
58.	2453 <i>Atriplex codonocarpa</i> (Flat-topped Saltbush)			
59.	2455 <i>Atriplex eardleyae</i>			
60.	2459 <i>Atriplex holocarpa</i> (Pop Saltbush)			
61.	2461 <i>Atriplex hymenotheca</i>			
62.	12042 <i>Atriplex lindleyi</i> subsp. <i>inflata</i>			
63.	11516 <i>Atriplex nummularia</i> subsp. <i>spathulata</i> (Old Man Saltbush)			
64.	11525 <i>Atriplex paludosa</i> subsp. <i>baudinii</i>			
65.	2472 <i>Atriplex pumilio</i>			
66.	11791 <i>Atriplex quadrivalvata</i> var. <i>quadrivalvata</i>			
67.	2476 <i>Atriplex semilunaris</i> (Annual Saltbush)			
68.	2479 <i>Atriplex stipitata</i> (Mallee Saltbush)			
69.	2480 <i>Atriplex suberecta</i>			
70.	2481 <i>Atriplex vesicaria</i> (Bladder Saltbush)			
71.	17237 <i>Austrostipa elegantissima</i>			
72.	17246 <i>Austrostipa nitida</i>			
73.	5344 <i>Baeckea elderiana</i>			
74.	5349 <i>Baeckea grandibracteata</i>			
75.	31153 <i>Baeckea grandibracteata</i> subsp. <i>Parker Range</i> (K. Newbey 9270)		P3	
76.	20806 <i>Baeckea</i> sp. <i>Bullfinch</i> (K.R. Newbey 5838)		P1	
77.	5375 <i>Balaustion pulcherrimum</i> (Native Pomegranate)			
78.	1801 <i>Banksia audax</i>			
79.	1815 <i>Banksia elderiana</i> (Swordfish Banksia)			
80.	5386 <i>Beaufortia interstans</i>			
81.	7852 <i>Bellida graminea</i> (Rosy Bellida)			
82.	34261 <i>Beyeria minor</i>			
83.	34276 <i>Beyeria sulcata</i> var. <i>brevipes</i>			
84.	34257 <i>Beyeria sulcata</i> var. <i>sulcata</i>			
85.	7856 <i>Blennospora drummondii</i>			
86.	4409 <i>Boronia coerulescens</i>			
87.	11498 <i>Boronia coerulescens</i> subsp. <i>spicata</i>			
88.	11201 <i>Boronia ternata</i> var. <i>ternata</i>			
89.	1267 <i>Borya constricta</i>			
90.	10915 <i>Brachychiton populneus</i> (Kurrajong)	Y		
91.	19437 <i>Brachysola coerulea</i>			
92.	15344 <i>Caladenia dimidia</i>			
93.	18023 <i>Caladenia horistes</i>			
94.	15356 <i>Caladenia incensa</i>			
95.	19219 <i>Caladenia mesocera</i>			
96.	15374 <i>Caladenia pachychila</i>			
97.	19280 <i>Caladenia paradoxa</i>			
98.	1614 <i>Caladenia roei</i> (Ant Orchid)			
99.	18594 <i>Caladenia</i> sp. <i>Muddarning Hill</i> (S.D. Hopper 4013)			
100.	18019 <i>Caladenia vulgata</i>			
101.	2853 <i>Calandrinia eremaea</i> (Twining Purslane)			
102.	92 <i>Callitris canescens</i>			
103.	96 <i>Callitris preissii</i> (Rottnest Island Pine, Maro)			
104.	5408 <i>Calothamnus gilesii</i>			
105.	5465 <i>Calytrix leschenaultii</i>			
106.	5466 <i>Calytrix merrelliana</i>			
107.	5476 <i>Calytrix sapphirina</i>			
108.	11211 <i>Cassytha glabella</i> forma <i>dispar</i>			
109.	7922 <i>Cephalopterum drummondii</i> (Pompom Head)			
110.	1215 <i>Chamaexeros fimbriata</i>			
111.	35640 <i>Chamelaucium pauciflorum</i> subsp. <i>Perenjori</i> (B.J. Conn 2181)			
112.	42180 <i>Chamelaucium</i> sp. <i>Bendering</i> (T.J. Alford 110)			
113.	37 <i>Cheilanthes lasiophylla</i> (Woolly Cloak Fern)			
114.	3168 <i>Cheiranthra filifolia</i>			
115.	2778 <i>Codonocarpus cotinifolius</i> (Native Poplar, Kundurangu)			
116.	4553 <i>Comesperma drummondii</i> (Drummond's Milkwort)			
117.	4561 <i>Comesperma scoparium</i> (Broom Milkwort)			
118.	4566 <i>Comesperma volubile</i> (Love Creeper)			
119.	40923 <i>Commersonia craurophylla</i> (Brittle Leaved Rulingia)			
120.	1861 <i>Conospermum brownii</i> (Blue-eyed Smokebush)			
121.	1868 <i>Conospermum distichum</i>			
122.	1882 <i>Conospermum stoechadis</i> (Common Smokebush)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
123.	1424 <i>Conostylis bealiana</i>			
124.	7419 <i>Coopermookia strophiolata</i>			
125.	32342 <i>Crossidium geheebii</i>			
126.	9076 <i>Cryptandra myriantha</i>			
127.	15400 <i>Cyanicula amplexans</i>			
128.	6747 <i>Cyanostegia angustifolia</i> (Tinsel-flower)			
129.	6751 <i>Cyanostegia microphylla</i> (Tinsel Flower)			
130.	7449 <i>Dampiera juncea</i> (Rush-like Dampiera)			
131.	7454 <i>Dampiera linearis</i> (Common Dampiera)			
132.	7456 <i>Dampiera luteiflora</i> (Yellow Dampiera)			
133.	7458 <i>Dampiera obliqua</i>			
134.	7475 <i>Dampiera spicigera</i> (Spiked Dampiera)			
135.	7477 <i>Dampiera stenostachya</i> (Narrow-spiked Dampiera)			
136.	13158 <i>Dampiera tenuicaulis</i> var. <i>curvula</i>			
137.	7483 <i>Dampiera tomentosa</i> (Felted Dampiera)			
138.	41026 <i>Dasymalla teckiana</i>			
139.	41025 <i>Dasymalla terminalis</i> (Native Foxglove)			
140.	16576 <i>Daviesia argillacea</i>			
141.	12975 <i>Daviesia benthamii</i> subsp. <i>acanthoclona</i>			
142.	3802 <i>Daviesia croniniana</i>			
143.	3813 <i>Daviesia grahamii</i>			
144.	16581 <i>Daviesia intricata</i> subsp. <i>xiphophylla</i>			
145.	12327 <i>Daviesia microcarpa</i>		T	
146.	11964 <i>Dichanthium sericeum</i> subsp. <i>sericeum</i>			
147.	2498 <i>Didymanthus roei</i>			
148.	32346 <i>Didymodon torquatus</i>			
149.	11681 <i>Disphyma crassifolium</i> subsp. <i>clavellatum</i>			
150.	2499 <i>Dissocarpus paradoxus</i> (Curious Saltbush)			
151.	7960 <i>Dithyrostegia amplexicaulis</i>			
152.	10858 <i>Diuris picta</i>			
153.	4753 <i>Dodonaea amblyophylla</i>			
154.	4760 <i>Dodonaea divaricata</i>			
155.	12034 <i>Dodonaea microzyga</i> var. <i>acrolobata</i>			
156.	4775 <i>Dodonaea piniifolia</i>			
157.	11247 <i>Dodonaea viscosa</i> subsp. <i>angustissima</i>			
158.	3088 <i>Drosera andersoniana</i> (Sturdy Sundew)			
159.	14298 <i>Drosera macrantha</i> subsp. <i>macrantha</i>			
160.	4459 <i>Drummondita hassellii</i>			
161.	6966 <i>Duboisia hopwoodii</i> (Pituri, Kundugu)			
162.	1066 <i>Ecdeiocolea monostachya</i>			
163.	12064 <i>Enchylaena tomentosa</i> var. <i>tomentosa</i> (Barrier Saltbush)			
164.	14104 <i>Eremaea pauciflora</i> var. <i>pauciflora</i>			
165.	13641 <i>Eremophila caerulea</i> subsp. <i>merrallii</i>		P4	
166.	13807 <i>Eremophila caperata</i>			
167.	7189 <i>Eremophila clarkei</i> (Turpentine Bush)			
168.	17156 <i>Eremophila clavata</i>			
169.	14895 <i>Eremophila decipiens</i> subsp. <i>decipiens</i>			
170.	7200 <i>Eremophila drummondii</i>			
171.	17175 <i>Eremophila glabra</i> subsp. <i>albicans</i>			
172.	7219 <i>Eremophila granitica</i> (Thin-leaved Poverty Bush)			
173.	15112 <i>Eremophila interstans</i> subsp. <i>interstans</i>			
174.	7226 <i>Eremophila ionantha</i> (Violet-flowered Eremophila)			
175.	7231 <i>Eremophila lehmanniana</i>			
176.	7242 <i>Eremophila miniata</i> (Kopi Poverty Bush)			
177.	18570 <i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i>			
178.	7267 <i>Eremophila scoparia</i> (Broom Bush ( ))			
179.	3869 <i>Erichsenia uncinata</i>			
180.	20718 <i>Ericksonella saccharata</i>			
181.	2514 <i>Eriochiton sclerolaenoides</i> (Woolly Bindii)			
182.	14377 <i>Erymophyllum ramosum</i> subsp. <i>ramosum</i>			
183.	19508 <i>Eucalyptus calycogona</i> subsp. <i>calycogona</i>			
184.	14300 <i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> (Mirret)			
185.	5607 <i>Eucalyptus corrugata</i> (Rough-fruited Mallee)			
186.	11294 <i>Eucalyptus crucis</i> subsp. <i>crucis</i> (Silver Mallee)		T	
187.	15667 <i>Eucalyptus eremophila</i> subsp. <i>eremophila</i> (Sand Mallee)			
188.	5662 <i>Eucalyptus gracilis</i> (Yorrell)			
189.	15743 <i>Eucalyptus incerata</i> (Mount Day Mallee)			
190.	20404 <i>Eucalyptus kochii</i> subsp. <i>yellowdinensis</i>			
191.	15682 <i>Eucalyptus leptophylla</i> (Narrow-leaved Red Mallee)			
192.	13059 <i>Eucalyptus leptopoda</i> subsp. <i>leptopoda</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
193.	13056 <i>Eucalyptus leptopoda</i> subsp. <i>subluta</i>			
194.	5701 <i>Eucalyptus longicornis</i> (Red Morrel, Moril)			
195.	20802 <i>Eucalyptus longissima</i>			
196.	13037 <i>Eucalyptus loxophleba</i> subsp. <i>lissophloia</i>			
197.	5711 <i>Eucalyptus melanoxylon</i> (Black Morrel)			
198.	19323 <i>Eucalyptus moderata</i>			
199.	5717 <i>Eucalyptus myriadena</i>			
200.	13513 <i>Eucalyptus myriadena</i> subsp. <i>myriadena</i>			
201.	13514 <i>Eucalyptus myriadena</i> subsp. <i>parviflora</i>		P1	
202.	13524 <i>Eucalyptus olivina</i>			
203.	5745 <i>Eucalyptus pileata</i> (Capped Mallee)			
204.	5747 <i>Eucalyptus platycorys</i> (Boorabbin Mallee)			
205.	13520 <i>Eucalyptus polita</i>			
206.	19064 <i>Eucalyptus prolixa</i>			
207.	12379 <i>Eucalyptus protensa</i>			
208.	5761 <i>Eucalyptus rigidula</i> (Stiff-leaved Mallee)			
209.	12693 <i>Eucalyptus salicola</i> (Salt Gum)			
210.	5766 <i>Eucalyptus salmonophloia</i> (Salmon Gum, Wurak)			
211.	5767 <i>Eucalyptus salubris</i> (Gimlet)			
212.	5772 <i>Eucalyptus sheathiana</i> (Ribbon-barked Gum)			
213.	34775 <i>Eucalyptus vittata</i>			
214.	17027 <i>Euryomyrtus leptospermoides</i>			
215.	16722 <i>Euryomyrtus maidenii</i>			
216.	19292 <i>Eutaxia lasiophylla</i>			
217.	10977 <i>Exocarpos aphyllus</i> (Leafless Ballart)			
218.	5205 <i>Frankenia irregularis</i>			
219.	5209 <i>Frankenia pauciflora</i> (Seaheath)			
220.	5212 <i>Frankenia setosa</i> (Bristly Frankenia)			
221.	11571 <i>Galenia pubescens</i> var. <i>pubescens</i>	Y		
222.	3900 <i>Gastrolobium floribundum</i> (Wodjil Poison)			
223.	10981 <i>Gastrolobium parviflorum</i>			
224.	6144 <i>Glischrocaryon flavescens</i>			
225.	10777 <i>Gompholobium gompholobioides</i>			
226.	3959 <i>Gompholobium viscidulum</i>			
227.	7504 <i>Goodenia dyeri</i>			
228.	7506 <i>Goodenia elderi</i>			
229.	19349 <i>Goodenia heatheriana</i>		P1	
230.	7517 <i>Goodenia incana</i> (Hoary Goodenia)			
231.	7527 <i>Goodenia mimulooides</i>			
232.	1971 <i>Grevillea cagiana</i> (Red Toothbrushes)			
233.	8830 <i>Grevillea ceratocarpa</i>			
234.	13453 <i>Grevillea didymobotrya</i> subsp. <i>didymobotrya</i>			
235.	2002 <i>Grevillea eryngioides</i> (Curly Grevillea)			
236.	8832 <i>Grevillea excelsior</i> (Flame Grevillea)			
237.	19314 <i>Grevillea hookeriana</i> subsp. <i>apiculoba</i>			
238.	8834 <i>Grevillea incrassata</i>			
239.	15974 <i>Grevillea incurva</i>			
240.	2047 <i>Grevillea nematophylla</i>			
241.	2055 <i>Grevillea oncogyne</i>			
242.	2057 <i>Grevillea paradoxa</i> (Bottlebrush Grevillea)			
243.	2077 <i>Grevillea pterosperma</i>			
244.	15766 <i>Grevillea shuttleworthiana</i> subsp. <i>obovata</i>			
245.	2104 <i>Grevillea teretifolia</i> (Round Leaf Grevillea)			
246.	2783 <i>Gyrostemon racemiger</i>			
247.	1465 <i>Haemodorum discolor</i>			
248.	2157 <i>Hakea erecta</i>			
249.	2163 <i>Hakea francisiana</i> (Emu Tree)			
250.	2181 <i>Hakea meisneriana</i>			
251.	2182 <i>Hakea minyma</i>			
252.	2184 <i>Hakea multilineata</i> (Grass Leaf Hakea)			
253.	12232 <i>Hakea pendens</i>		P3	
254.	2195 <i>Hakea platysperma</i> (Cricket Ball Hakea)			
255.	17556 <i>Hakea recurva</i> subsp. <i>arida</i>			
256.	2217 <i>Hakea verrucosa</i>			
257.	6684 <i>Halgania andromedifolia</i>			
258.	6691 <i>Halgania integerrima</i>			
259.	6180 <i>Haloragis trigonocarpa</i>			
260.	6776 <i>Hemiphora elderi</i> (Red Velvet)			
261.	19692 <i>Hibbertia ancistrophylla</i>			
262.	5115 <i>Hibbertia conspicua</i> (Leafless Hibbertia)			



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263.	5122 <i>Hibbertia eatoniae</i>			
264.	19779 <i>Hibbertia glomerosa</i> var. <i>glomerosa</i>			
265.	5165 <i>Hibbertia rostellata</i>			
266.	15863 <i>Hibbertia stowardii</i>			
267.	5813 <i>Homalocalyx pulcherrimus</i>			
268.	5815 <i>Homalocalyx thryptomenoides</i>			
269.	448 <i>Hordeum glaucum</i> (Northern Barley Grass)	Y		
270.	15447 <i>Hyalosperma glutinosum</i> subsp. <i>glutinosum</i>			
271.	12007 <i>Hybanthus floribundus</i> subsp. <i>floribundus</i>			
272.	8086 <i>Hypochaeris glabra</i> (Smooth Catsear)	Y		
273.	16812 <i>Isopogon scabriusculus</i> subsp. <i>pubifloris</i>			
274.	14436 <i>Isopogon scabriusculus</i> subsp. <i>stenophyllus</i>			
275.	14779 <i>Jacksonia arida</i>			
276.	4021 <i>Jacksonia nematoclada</i>			
277.	20709 <i>Jacksonia ramulosa</i>			
278.	1178 <i>Juncus bufonius</i> (Toad Rush)	Y		
279.	4043 <i>Kennedia prorepens</i>			
280.	19892 <i>Keraudrenia velutina</i> subsp. <i>velutina</i>			
281.	29046 <i>Lactuca serriola</i> forma <i>serriola</i>	Y		
282.	13284 <i>Lawrencella rosea</i>			
283.	4957 <i>Lawrenzia repens</i>			
284.	11815 <i>Laxmannia grandiflora</i> subsp. <i>grandiflora</i>			
285.	1306 <i>Laxmannia paleacea</i>			
286.	7569 <i>Lechenaultia brevifolia</i>			
287.	44490 <i>Leontodon rhagadioloides</i>	Y		
288.	3018 <i>Lepidium africanum</i> (Rubble Peppergrass)	Y		
289.	41647 <i>Lepidosperma sanguinolentum</i>			
290.	2352 <i>Leptomeria preissiana</i>			
291.	5847 <i>Leptospermum erubescens</i> (Roadside Teatree)			
292.	5852 <i>Leptospermum nitens</i>			
293.	5855 <i>Leptospermum roei</i>			
294.	13260 <i>Leucochrysum fitzgibbonii</i>			
295.	6401 <i>Leucopogon hamulosus</i>			
296.	41770 <i>Leucopogon</i> sp. <i>Boorabbin</i> (K.R. Newbey 8374)			
297.	36059 <i>Leucopogon</i> sp. <i>Yellowdine</i> (M. Hislop & F. Hort MH 3194)		P1	
298.	19517 <i>Leucopogon</i> sp. <i>outer wheatbelt</i> (M. Hislop 30)			
299.	6488 <i>Limonium lobatum</i>	Y		
300.	6489 <i>Limonium sinuatum</i> (Perennial Sea Lavender)	Y		
301.	6514 <i>Logania tortuosa</i>			
302.	4061 <i>Lotus cruentus</i> (Redflower Lotus)			
303.	2396 <i>Lysiana casuarinae</i>			
304.	36375 <i>Lysimachia arvensis</i> (Pimpernel)	Y		
305.	34736 <i>Lysinema pentapetalum</i>			
306.	2533 <i>Maireana amoena</i>			
307.	2537 <i>Maireana brevifolia</i> (Small Leaf Bluebush)			
308.	2544 <i>Maireana georgei</i> (Satiny Bluebush)			
309.	2568 <i>Maireana trichoptera</i> (Downy Bluebush)			
310.	5864 <i>Malleostemon peltiger</i>			
311.	5865 <i>Malleostemon roseus</i>			
312.	4961 <i>Malva parviflora</i> (Marshmallow)	Y		
313.	19421 <i>Marianthus bicolor</i> (Painted Marianthus)			
314.	4077 <i>Medicago minima</i> (Small Burr Medic)	Y		
315.	4078 <i>Medicago orbicularis</i> (Button Medic)	Y		Y
316.	15063 <i>Melaleuca acuminata</i> subsp. <i>acuminata</i>			
317.	19380 <i>Melaleuca calyptroides</i>			
318.	5896 <i>Melaleuca cordata</i>			
319.	19486 <i>Melaleuca hamata</i>			
320.	5917 <i>Melaleuca hamulosa</i>			
321.	5925 <i>Melaleuca lateriflora</i> (Gorada)			
322.	5929 <i>Melaleuca leiocarpa</i>			
323.	15663 <i>Melaleuca pauperiflora</i> subsp. <i>fastigiata</i>			
324.	5958 <i>Melaleuca radula</i> (Graceful Honey Myrtle)			
325.	2813 <i>Mesembryanthemum crystallinum</i> (Iceplant)	Y		
326.	2814 <i>Mesembryanthemum nodiflorum</i> (Slender Iceplant)	Y		
327.	6891 <i>Microcorys ericifolia</i>			
328.	17402 <i>Microcorys</i> sp. <i>stellate</i> (A. Strid 21885)			
329.	18046 <i>Microcybe multiflora</i> subsp. <i>multiflora</i>			
330.	9187 <i>Micromyrtus erichsenii</i>			
331.	14382 <i>Microtis eremaea</i>			
332.	14338 <i>Millotia newbeyi</i>		P1	

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333.	12631 <i>Millotia perpusilla</i>			
334.	14344 <i>Millotia tenuifolia</i> var. <i>tenuifolia</i> (Soft Millotia)			
335.	4099 <i>Mirbelia seorsifolia</i>			
336.	4104 <i>Mirbelia trichocalyx</i>			
337.	490 <i>Monachather paradoxus</i>			
338.	19177 <i>Moraea setifolia</i>	Y		
339.	6974 <i>Nicotiana glauca</i> (Tree Tobacco)	Y		
340.	8134 <i>Olearia exiguiifolia</i> (Small-leaved Daisy Bush)			
341.	8136 <i>Olearia homolepis</i>			
342.	8139 <i>Olearia magniflora</i>			
343.	8140 <i>Olearia muelleri</i> (Goldfields Daisy)			
344.	8141 <i>Olearia muricata</i> (Rough-leaved Daisy Bush)			
345.	8145 <i>Olearia pimeleoides</i> (Pimelea Daisybush, Burrobunga)			
346.	12646 <i>Ozothamnus occidentalis</i>			
347.	40424 <i>Pentameris airoides</i> subsp. <i>airoides</i>	Y		
348.	2259 <i>Persoonia coriacea</i> (Leathery-leaf Persoonia)			
349.	15630 <i>Persoonia inconspicua</i>			
350.	2274 <i>Persoonia saundersiana</i>			
351.	3674 <i>Petalostylis cassioides</i>			
352.	14446 <i>Petrophile arcuata</i>			
353.	14445 <i>Petrophile merrallii</i>			
354.	2308 <i>Petrophile seminuda</i>			
355.	4500 <i>Phebalium filifolium</i> (Slender Phebalium)			
356.	4501 <i>Phebalium lepidotum</i>			
357.	16556 <i>Phebalium megaphyllum</i>			
358.	4504 <i>Phebalium tuberosum</i>			
359.	18537 <i>Philothea brucei</i> subsp. <i>brucei</i>			
360.	18519 <i>Philothea coccinea</i>			
361.	18385 <i>Philothea deserti</i> subsp. <i>deserti</i>			
362.	18506 <i>Philothea tomentella</i>			
363.	5229 <i>Pimelea aeruginosa</i>			
364.	5231 <i>Pimelea angustifolia</i> (Narrow-leaved Pimelea)			
365.	11227 <i>Pimelea brevifolia</i> subsp. <i>modesta</i>			
366.	11402 <i>Pimelea imbricata</i> var. <i>piligera</i>			
367.	11185 <i>Pimelea microcephala</i> subsp. <i>microcephala</i>			
368.	12104 <i>Pimelea spiculigera</i> var. <i>thesioides</i>			
369.	11910 <i>Pimelea suaveolens</i> subsp. <i>flava</i>			
370.	5268 <i>Pimelea sulphurea</i> (Yellow Banjine)			
371.	19744 <i>Pittosporum angustifolium</i>			
372.	6812 <i>Pityrodia lepidota</i>			
373.	6255 <i>Platysace juncea</i>			
374.	14999 <i>Platysace trachymenioides</i>			
375.	571 <i>Poa annua</i> (Winter Grass)	Y		
376.	8173 <i>Podolepis capillaris</i> (Wiry Podolepis)			
377.	8182 <i>Podotheca angustifolia</i> (Sticky Longheads)			
378.	8184 <i>Podotheca gnaphalioides</i> (Golden Long-heads)			
379.	8187 <i>Pogonolepis muelleriana</i>			
380.	16688 <i>Prasophyllum gracile</i>			
381.	6912 <i>Prostanthera campbellii</i>			
382.	6916 <i>Prostanthera grylloana</i>			
383.	12704 <i>Prostanthera nanophylla</i>		P3	
384.	6923 <i>Prostanthera semiteres</i>			
385.	12120 <i>Prostanthera semiteres</i> subsp. <i>semiteres</i>			
386.	4725 <i>Psammomoya choretroides</i>			
387.	1689 <i>Pterostylis mutica</i> (Midget Greenhood)			
388.	10778 <i>Pterostylis picta</i>			
389.	1693 <i>Pterostylis recurva</i> (Jug Orchid)			
390.	1696 <i>Pterostylis sargentii</i> (Frog Greenhood)			
391.	10897 <i>Pterostylis spathulata</i>			
392.	2707 <i>Ptilotus carlsonii</i>			
393.	2729 <i>Ptilotus grandiflorus</i>			
394.	2732 <i>Ptilotus holosericeus</i>			
395.	41001 <i>Ptilotus nobilis</i> subsp. <i>nobilis</i> (Yellow Tails)			
396.	2747 <i>Ptilotus obovatus</i> (Cotton Bush)			
397.	41000 <i>Ptilotus</i> sp. Goldfields (R. Davis 10796)			
398.	2760 <i>Ptilotus spathulatus</i>			
399.	32417 <i>Ptychostomum angustifolium</i>			
400.	4964 <i>Radyera farragei</i> (Knobby Hibiscus)			
401.	13294 <i>Rhodanthe laevis</i>			
402.	13249 <i>Rhodanthe oppositifolia</i> subsp. <i>oppositifolia</i>			

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403.	13252 <i>Rhodanthe pygmaea</i>			
404.	13253 <i>Rhodanthe rubella</i>			
405.	11151 <i>Rostraria pumila</i>	Y		
406.	2587 <i>Roycea divaricata</i>			
407.	40425 <i>Rytidosperma caespitosum</i>			
408.	40427 <i>Rytidosperma setaceum</i>			
409.	30434 <i>Salsola australis</i>			
410.	2356 <i>Santalum acuminatum</i> (Quandong, Warnga)			
411.	7639 <i>Scaevola restiacea</i>			
412.	8200 <i>Schoenia cassiniana</i> (Schoenia)			
413.	993 <i>Schoenus hexandrus</i>			
414.	2609 <i>Sclerolaena diacantha</i> (Grey Copperburr)			
415.	17645 <i>Senna artemisioides</i>			
416.	12276 <i>Senna artemisioides</i> subsp. <i>filifolia</i>			
417.	3072 <i>Sisymbrium orientale</i> (Indian Hedge Mustard)	Y		
418.	3073 <i>Sisymbrium runcinatum</i>	Y		
419.	7022 <i>Solanum nigrum</i> (Black Berry Nightshade)	Y		
420.	8231 <i>Sonchus oleraceus</i> (Common Sowthistle)	Y		
421.	4735 <i>Stackhousia scoparia</i>			
422.	31712 <i>Stenanthemum bremerense</i>		P4	
423.	3076 <i>Stenopetalum filifolium</i>			
424.	7685 <i>Stylidium arenicola</i>			
425.	7701 <i>Stylidium choreanthum</i> (Dancing Triggerplant)		P3	
426.	7714 <i>Stylidium dielsianum</i> (Tangle Triggerplant)			
427.	7751 <i>Stylidium limbatum</i> (Fringed-leaved Triggerplant)			
428.	7774 <i>Stylidium piliferum</i> (Common Butterfly Triggerplant)			
429.	7810 <i>Stylidium yilgarnense</i> (Yilgarn Triggerplant)			
430.	43203 <i>Surreya diandra</i>			
431.	16761 <i>Synaphea interioris</i>			
432.	15534 <i>Synaphea spinulosa</i> subsp. <i>major</i>			
433.	33236 <i>Tecticornia halocnemoides</i> (Shrubby Samphire)			
434.	33297 <i>Tecticornia pergranulata</i> subsp. <i>pergranulata</i> (Blackseed Samphire)			
435.	31618 <i>Tecticornia pruinosa</i>			
436.	33218 <i>Tecticornia pterygosperma</i> subsp. <i>pterygosperma</i>			
437.	31717 <i>Tecticornia undulata</i>			
438.	35840 <i>Templetonia ceracea</i>			
439.	4257 <i>Templetonia smithiana</i>			
440.	42065 <i>Tetrapora tenuiramea</i>			
441.	4530 <i>Tetratheca efoliata</i>			
442.	19396 <i>Teucrium</i> sp. <i>Norseman</i> (T.E.H. Aplin 1851)			
443.	13298 <i>Thiseltonia gracillima</i>			
444.	6058 <i>Thryptomene kochii</i>			
445.	1338 <i>Thysanotus manglesianus</i> (Fringed Lily)			
446.	678 <i>Tragus australianus</i> (Small Burrgrass)			
447.	1363 <i>Tricoryne tenella</i>			
448.	15509 <i>Trifolium tomentosum</i> var. <i>tomentosum</i>	Y		
449.	17874 <i>Triodia rigidissima</i>			
450.	4737 <i>Tripterococcus brunonis</i> (Winged Stackhousia)			
451.	98 <i>Typha domingensis</i> (Bulrush, Djandjidd)			
452.	9008 <i>Urodon dasyphyllus</i> (Mop Bushpea)			
453.	7658 <i>Velleia discophora</i> (Cabbage Poison)			
454.	6071 <i>Verticordia brachypoda</i>			
455.	6073 <i>Verticordia chrysantha</i>			
456.	12422 <i>Verticordia eriocephala</i> (Common Cauliflower)			
457.	12428 <i>Verticordia halophila</i>			
458.	12432 <i>Verticordia inclusa</i>			
459.	36801 <i>Verticordia mitchelliana</i> subsp. <i>implexior</i>			
460.	12442 <i>Verticordia mitodes</i>		P3	
461.	12445 <i>Verticordia multiflora</i> subsp. <i>solox</i>		P2	
462.	6109 <i>Verticordia picta</i> (Painted Featherflower)			
463.	12451 <i>Verticordia plumosa</i> var. <i>incrassata</i>			
464.	6113 <i>Verticordia pritzelii</i> (Pritzel's Featherflower)			
465.	6114 <i>Verticordia rennieana</i>			
466.	15267 <i>Verticordia roei</i> subsp. <i>roei</i>			
467.	6121 <i>Verticordia stenopetala</i>		P3	
468.	8266 <i>Vittadinia gracilis</i>			
469.	13331 <i>Waitzia acuminata</i> var. <i>acuminata</i>			
470.	6938 <i>Westringia cephalantha</i>			
471.	9247 <i>Westringia rigida</i> (Stiff Westringia)			
472.	1396 <i>Wurmbea graniticola</i>			



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473.	1248 <i>Xerolirion divaricata</i> (Basil's Asparagus)			
474.	4386 <i>Zygophyllum aurantiacum</i> (Shrubby Twinleaf)			
475.	4391 <i>Zygophyllum glaucum</i> (Pale Twinleaf)			

**Conservation Codes**

- T - Rare or likely to become extinct
- X - Presumed extinct
- IA - Protected under international agreement
- S - Other specially protected fauna
- 1 - Priority 1
- 2 - Priority 2
- 3 - Priority 3
- 4 - Priority 4
- 5 - Priority 5

<sup>1</sup> For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

## **Appendix 2. Flora Species List.**

Family	Species Name	Notes
Aizoaceae	<i>Mesembryanthemum nodiflorum</i>	Weed
Casuarinaceae	<i>Allocasuarina helmsii</i>	
Amaranthaceae	<i>Ptilotus aervoides</i>	
Amaranthaceae	<i>Ptilotus carlsonii</i>	
Amaranthaceae	<i>Ptilotus gaudichaudii</i> var. <i>parviflorus</i>	
Amaranthaceae	<i>Ptilotus holosericeus</i>	
Amaranthaceae	<i>Ptilotus</i> sp. Goldfields (R. Davis 10796)	
Apiaceae	<i>Daucus glochidiatus</i>	
Apiaceae	<i>Trachymene cyanopetala</i>	
Apocynaceae	<i>Alyxia buxifolia</i>	
Araliaceae	<i>Hydrocotyle corynophora</i>	Priority 1
Asparagaceae	<i>Arthropodium curvipes</i>	
Asparagaceae	<i>Thysanotus</i> sp. Indeterminate	Insufficient material to ID
Asteraceae	<i>Actinobole uliginosum</i>	
Asteraceae	<i>Angianthus tomentosus</i>	
Asteraceae	<i>Arctotheca calendula</i>	Weed
Asteraceae	<i>Asteridea athrxioides</i>	
Asteraceae	<i>Brachyscome iberidifolia</i>	
Asteraceae	<i>Calotis erinacea</i>	Range Extension
Asteraceae	<i>Calotis hispidula</i>	
Asteraceae	<i>Centaurea melitensis</i>	Weed
Asteraceae	<i>Erymophyllum ramosum</i> subsp. <i>ramosum</i>	
Asteraceae	<i>Gnephosis intonsa</i>	Priority 3
Asteraceae	<i>Hyalosperma glutinosum</i> subsp. <i>glutinosum</i>	
Asteraceae	<i>Hypochaeris glabra</i>	Weed
Asteraceae	<i>Lawrencella rosea</i>	
Asteraceae	<i>Leucochrysum fitzgibbonii</i>	
Asteraceae	<i>Olearia muelleri</i>	
Asteraceae	<i>Olearia pimeleoides</i>	
Asteraceae	<i>Podolepis capillaris</i>	
Asteraceae	<i>Podolepis lessonii</i>	
Asteraceae	<i>Podotheca gnaphalioides</i>	
Asteraceae	<i>Pogonolepis muelleriana</i>	
Asteraceae	<i>Rhodanthe chlorocephala</i> subsp. <i>rosea</i>	
Asteraceae	<i>Rhodanthe citrina</i>	
Asteraceae	<i>Rhodanthe pygmaea</i>	
Asteraceae	<i>Senecio pinnatifolius</i>	
Asteraceae	<i>Siloxerus pygmaeus</i>	
Asteraceae	<i>Sonchus oleraceus</i>	Weed
Brassicaceae	<i>Brassica tournefortii</i>	Weed

Family	Species Name	Notes
Brassicaceae	<i>Carrichtera annua</i>	Weed
Brassicaceae	<i>Phlegmatospermum eremaeum</i>	Priority 3
Brassicaceae	<i>Stenopetalum filifolium</i>	
Brassicaceae	<i>Stenopetalum lineare</i> var. <i>lineare</i>	
Caryophyllaceae	<i>Stellaria filiformis</i>	
Chenopodiaceae	<i>Atriplex bunburyana</i>	
Chenopodiaceae	<i>Atriplex nummularia</i>	
Chenopodiaceae	<i>Atriplex semilunaris</i>	
Chenopodiaceae	<i>Atriplex stipitata</i>	
Chenopodiaceae	<i>Atriplex vesicaria</i>	
Chenopodiaceae	<i>Chenopodium curvispicatum</i>	
Chenopodiaceae	<i>Enchylaena lanata</i>	
Chenopodiaceae	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	
Chenopodiaceae	<i>Eriochiton sclerolaenoides</i>	
Chenopodiaceae	<i>Maireana brevifolia</i>	
Chenopodiaceae	<i>Maireana georgei</i>	
Chenopodiaceae	<i>Maireana thesioides</i>	
Chenopodiaceae	<i>Maireana tomentosa</i> subsp. <i>tomentosa</i>	
Chenopodiaceae	<i>Maireana trichoptera</i>	
Chenopodiaceae	<i>Rhagodia drummondii</i>	
Chenopodiaceae	<i>Sclerolaena diacantha</i>	
Chenopodiaceae	<i>Sclerolaena fusiformis</i>	
Colchicaceae	<i>Wurmbea densiflora</i>	
Convolvulaceae	<i>Wilsonia humilis</i>	
Cyperaceae	<i>Lepidosperma</i> aff. <i>fimbriatum</i>	Species of Interest
Dilleniaceae	<i>Hibbertia exasperata</i>	
Euphorbiaceae	<i>Beyeria sulcata</i> var. <i>brevipes</i>	
Euphorbiaceae	<i>Spergularia rubra</i>	Weed
Fabaceae	<i>Acacia acuminata</i>	
Fabaceae	<i>Acacia colletioides</i>	
Fabaceae	<i>Acacia erinacea</i>	
Fabaceae	<i>Acacia intricata</i>	
Fabaceae	<i>Acacia merrallii</i>	
Fabaceae	<i>Acacia rendlei</i>	
Fabaceae	<i>Acacia</i> sp. Indeterminate	Insufficient Material to ID
Fabaceae	<i>Acacia tetragonophylla</i>	
Fabaceae	<i>Daviesia</i> aff. <i>rubiginosa</i>	Leaves longer than typical
Fabaceae	<i>Eutaxia neurocalyx</i> subsp. <i>neurocalyx</i>	
Fabaceae	<i>Medicago minima</i>	Weed



Family	Species Name	Notes
Fabaceae	<i>Mirbelia microphylla</i>	
Fabaceae	<i>Senna artemisioides</i> subsp. <i>filifolia</i>	
Fabaceae	<i>Swainsona</i> sp. Indeterminate	Insufficient Material to ID
Fabaceae	<i>Templetonia sulcata</i>	
Geraniaceae	<i>Erodium cygnorum</i>	
Goodeniaceae	<i>Goodenia heatheriana</i>	Priority 1
Goodeniaceae	<i>Goodenia pinnatifida</i>	
Goodeniaceae	<i>Scaevola spinescens</i> (broad leaf form)	
Haloragaceae	<i>Haloragis trigonocarpa</i>	
Iridaceae	<i>Moraea setifolia</i>	Weed
Lamiaceae	<i>Hemigenia</i> sp. Newdegate (E. Bishop 75)	Priority 1
Lamiaceae	<i>Prostanthera semiteres</i> subsp. <i>semiteres</i>	
Lamiaceae	<i>Westringia rigida</i>	
Loranthaceae	<i>Amyema miquelii</i>	
Malvaceae	<i>Commersonia craurophylla</i>	
Malvaceae	<i>Lawrencia diffusa</i>	
Myrtaceae	<i>Eucalyptus calycogona</i> subsp. <i>calycogona</i>	
Myrtaceae	<i>Eucalyptus corrugata</i>	
Myrtaceae	<i>Eucalyptus loxophleba</i> subsp. <i>lissophloia</i>	
Myrtaceae	<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>	
Myrtaceae	<i>Eucalyptus salmonophloia</i>	
Myrtaceae	<i>Eucalyptus salubris</i>	
Myrtaceae	<i>Eucalyptus vittata</i>	
Myrtaceae	<i>Eucalyptus yilgarnensis</i>	
Myrtaceae	<i>Melaleuca hamata</i>	
Myrtaceae	<i>Melaleuca pauperiflora</i> subsp. <i>fastigiata</i>	
Plantaginaceae	<i>Plantago drummondii</i>	
Poaceae	<i>Amphipogon caricinus</i> subsp. <i>caricinus</i>	
Poaceae	<i>Aristida contorta</i>	
Poaceae	<i>Austrostipa elegantissima</i>	
Poaceae	<i>Austrostipa hemipogon</i>	
Poaceae	<i>Austrostipa nitida</i>	
Poaceae	<i>Austrostipa trichophylla</i>	
Poaceae	<i>Avena barbata</i>	Weed
Poaceae	<i>Eriachne pulchella</i> subsp. <i>pulchella</i>	
Poaceae	<i>Hordeum leporinum</i>	Weed
Poaceae	<i>Parapholis incurva</i>	Weed
Poaceae	<i>Pentameris airoides</i> subsp. <i>airoides</i>	Weed
Poaceae	<i>Rytidosperma caespitosum</i>	
Poaceae	<i>Vulpia myuros</i>	Weed

Family	Species Name	Notes
Portulacaceae	<i>Calandrinia eremaea</i>	
Primulaceae	<i>Lysimachia arvensis</i>	Weed
Proteaceae	<i>Grevillea obliquistigma</i> subsp. <i>obliquistigma</i>	
Rhamnaceae	<i>Cryptandra connata</i>	
Rhamnaceae	<i>Trymalium myrtillus</i> subsp. <i>myrtillus</i>	
Rutaceae	<i>Phebalium megaphyllum</i>	
Rutaceae	<i>Phebalium tuberosum</i>	
Santalaceae	<i>Exocarpos aphyllus</i>	
Santalaceae	<i>Santalum acuminatum</i>	
Sapindaceae	<i>Dodonaea stenozyga</i>	
Scrophulariaceae	<i>Eremophila decipiens</i> subsp. <i>decipiens</i>	
Scrophulariaceae	<i>Eremophila glabra</i>	
Scrophulariaceae	<i>Eremophila interstans</i> subsp. <i>interstans</i>	
Scrophulariaceae	<i>Eremophila rugosa</i>	
Scrophulariaceae	<i>Eremophila scoparia</i>	
Solanaceae	<i>Lycium australe</i>	
Solanaceae	<i>Solanum hoplopetalum</i>	
Violaceae	<i>Hybanthus floribundus</i> subsp. <i>curvifolius</i>	
Zygophyllaceae	<i>Zygophyllum apiculatum</i>	
Zygophyllaceae	<i>Zygophyllum eremaeum</i>	
Zygophyllaceae	<i>Zygophyllum glaucum</i>	

### **Appendix 3. Significant Flora Locations and Plant Counts.**

All data presented within GDA94 datum. Includes only data from survey results.

Significant Species	Location Coordinates	Number of Plants
<i>Gnephis intonsa</i> (P3)	50 J 727323 6529040	2000
	50 J 727303 6528928	12
	50 J 727278 6529032	9
	50 J 727284 6529030	30
	50 J 727287 6529026	5
	50 J 727303 6529044	20
	50 J 727292 6529049	3
	50 J 727179 6528943	2
	50 J 727197 6528931	250
	50 J 727200 6528928	1000
	50 J 727182 6528914	600
	50 J 727135 6528926	12
	50 J 727141 6528927	20
	50 J 727163 6528939	6
	50 J 727168 6528945	30
	50 J 727164 6528947	10
	50 J 727163 6528951	10
	50 J 727160 6528953	5
	50 J 727154 6528966	50
	50 J 727153 6529004	15
	50 J 727220 6529224	20
	50 J 727243 6529266	200
	50 J 727207 6529264	100
	50 J 727140 6528919	20
	50 J 727158 6528943	5
	50 J 727157 6528954	6
	50 J 727133 6528937	100
	50 J 727198 6528883	300
	50 J 727203 6528854	2000
	50 J 727187 6528881	75
	50 J 727214 6528854	500
	50 J 727250 6528865	3
	50 J 727258 6528869	100
	50 J 727262 6528885	50
	50 J 727274 6528869	125
	50 J 727281 6528869	50
	50 J 727297 6528875	50
	50 J 727527 6529060	4
	50 J 727528 6529068	40



Significant Species	Location Coordinates	Number of Plants
<i>Gnephosis intonsa</i> (P3) ----- Continued	50 J 727535 6529063	20
	50 J 727511 6529110	10
	50 J 727506 6529108	250
	50 J 727504 6529120	200
	50 J 727501 6529130	1000
	50 J 727494 6529146	250
	50 J 727542 6529071	2
	50 J 726823 6529651	1000
	50 J 726786 6529662	500
	50 J 726787 6529669	100
	50 J 726826 6529667	500
	50 J 726816 6529672	1000
	50 J 726818 6529697	1000
	50 J 726796 6529721	400
	50 J 726786 6529721	100
	50 J 726772 6529721	200
	50 J 726776 6529724	200
	50 J 726781 6529723	200
	50 J 726790 6529724	200
	50 J 726756 6529728	100
	50 J 726753 6529734	200
	50 J 726747 6529735	1500
	50 J 726742 6529733	250
	50 J 726735 6529736	150
	50 J 726750 6529795	1000
	50 J 726737 6529794	500
	50 J 726721 6529792	300
	50 J 726690 6529820	100
	50 J 726693 6529821	500
	50 J 726693 6529826	100
	50 J 726692 6529830	100
	50 J 726690 6529834	100
	50 J 726688 6529838	100
	50 J 726686 6529842	100
	50 J 726684 6529845	100
	50 J 726683 6529850	100
	50 J 726681 6529854	200
	50 J 726692 6529859	200
	50 J 726695 6529861	200
	50 J 726700 6529862	200

Significant Species	Location Coordinates	Number of Plants
<i>Gnephosis intonsa</i> (P3) ----- Continued	50 J 726707 6529862	200
	50 J 726708 6529867	200
	50 J 726697 6529877	200
	50 J 726690 6529879	200
	50 J 726686 6529879	200
	50 J 726680 6529879	200
	50 J 726682 6529882	200
	50 J 726682 6529886	200
	50 J 726684 6529926	2500
	50 J 726670 6529925	2500
	50 J 726664 6529934	750
	50 J 726674 6529940	100
	50 J 726687 6529957	100
	50 J 726677 6529972	100
	50 J 726651 6529971	100
	50 J 726635 6530051	100
	50 J 726636 6530049	100
	50 J 726635 6530047	100
	50 J 726633 6530048	100
	50 J 726632 6530043	100
	50 J 726633 6530040	100
	50 J 726625 6530042	100
	50 J 726623 6530047	100
	50 J 726622 6530050	100
	50 J 726623 6530053	100
	50 J 726622 6530057	100
	50 J 726619 6530059	100
	50 J 726552 6530167	5
	50 J 726550 6530169	100
	50 J 726560 6530164	100
	50 J 726563 6530164	100
	50 J 726564 6530160	100
	50 J 726674 6529897	100
	50 J 726674 6529896	100
	50 J 728552 6529379	500
	50 J 728551 6529376	500
	50 J 728529 6529377	100
	50 J 728517 6529383	100
	50 J 728585 6529418	200

Significant Species	Location Coordinates	Number of Plants
<i>Gnephosis intonsa</i> (P3) ----- Continued	50 J 728584 6529421	200
	50 J 728623 6529361	10
	50 J 728614 6529353	10
	50 J 728603 6529324	1000
	50 J 728547 6529315	250
	50 J 728262 6529359	100
	50 J 728265 6529355	100
	50 J 728277 6529346	2500
	50 J 728283 6529338	100
	50 J 728289 6529341	100
	50 J 728294 6529344	100
	50 J 728301 6529346	100
	50 J 728353 6529269	1
	50 J 728354 6529265	250
	50 J 728306 6529302	10
	50 J 727316 6528853	25
	50 J 727318 6528848	25
	50 J 727320 6528860	100
	50 J 727323 6528870	50
	50 J 727349 6528877	100
	50 J 727358 6528881	10
	50 J 727363 6528880	10
	50 J 727366 6528880	10
	50 J 727367 6528879	20
	50 J 727296 6528882	100
	50 J 727372 6528942	1
	50 J 727251 6528805	15
	50 J 727349 6528747	300
	50 J 727381 6528744	1000
	50 J 727414 6528729	200
	50 J 727302 6528809	400
	50 J 727279 6528276	5
	50 J 727277 6528262	2000
	50 J 727296 6528266	5
	50 J 727301 6528266	35
	50 J 727319 6528276	100
	50 J 727350 6528320	500
	50 J 727565 6528521	500
	50 J 727555 6528516	400
	50 J 727569 6528547	20

Significant Species	Location Coordinates	Number of Plants
<i>Gnephosis intonsa</i> (P3) ----- Continued	50 J 727505 6528576	1250
	50 J 727499 6528574	300
	50 J 727304 6528284	100
	50 J 727309 6528278	100
	50 J 727551 6528110	500
	50 J 727558 6528110	150
	50 J 727285 6528239	500
	50 J 727138 6528938	50
	50 J 727118 6528929	500
	50 J 727082 6528962	200
	50 J 727023 6529021	10
	50 J 727060 6529071	50
	50 J 727060 6529078	15
	50 J 727112 6529055	12
	50 J 727109 6529103	10
	50 J 727102 6529148	50
	50 J 727065 6529227	25
	50 J 726963 6529245	500
	50 J 727141 6528883	20
	50 J 727212 6528863	500
	50 J 727215 6528877	500
	50 J 727200 6528875	500
	50 J 727245 6528891	10
	50 J 727255 6528886	100
	50 J 727274 6528896	100
	50 J 727371 6528964	5
	50 J 727375 6528953	50
	50 J 727385 6528982	20
	50 J 727801 6529342	10
	50 J 727013 6528996	20
	50 J 726872 6529526	50
	50 J 726860 6529517	10
	50 J 726865 6529497	50
	50 J 726936 6529414	20
	50 J 726923 6529403	20
	50 J 726908 6529391	30
	50 J 726910 6529382	20
	50 J 726773 6529675	10
	50 J 726782 6529725	50



Significant Species	Location Coordinates	Number of Plants
<i>Gnephosis intonsa</i> (P3) ----- Continued	50 J 726755 6529722	20
	50 J 726735 6529722	500
	50 J 726746 6529681	200
	50 J 726700 6529800	23
	50 J 726690 6529817	27
	50 J 726679 6529855	2
	50 J 728655 6529361	15
	50 J 728635 6529364	10
	50 J 728615 6529357	20
	50 J 728316 6529326	20
	50 J 728308 6529290	5
	50 J 728316 6529255	50
	50 J 728316 6529238	300
	50 J 728237 6529406	20
	50 J 727257 6528830	100
	50 J 727242 6528821	100
	50 J 727232 6528815	100
	50 J 727252 6528780	25
	50 J 727301 6528697	100
	50 J 727310 6528701	100
	50 J 727410 6528685	20
	50 J 727406 6528699	100
	50 J 727396 6528726	1000
	50 J 727317 6528795	500
	50 J 727402 6528894	100
	50 J 727490 6528936	100
	50 J 727351 6528735	100
	50 J 727281 6528825	100
	50 J 727343 6528299	200
	50 J 727354 6528296	100
	50 J 727358 6528298	1000
	50 J 727475 6528316	100
	50 J 727508 6528445	100
	50 J 727528 6528471	50
<i>Goodenia heatheriana</i> (P1)	50 J 727349 6528747	150
	50 J 727379 6528738	750
	50 J 727327 6528924	10
	50 J 727347 6528762	100
	50 J 727372 6528721	20
	50 J 727411 6528721	1000

Significant Species	Location Coordinates	Number of Plants
<i>Goodenia heatheriana</i> (P1) ----- Continued	50 J 727421 6528723	1000
	50 J 727332 6528282	100
	50 J 727343 6528299	100
	50 J 727358 6528298	1500
	50 J 727573 6528090	200
	50 J 727564 6528097	300
	50 J 727319 6528909	200
	50 J 727305 6528891	100
<i>Hemigenia</i> sp. Newdegate (E. Bishop 75) (P1)	50 J 727014 6529021	4
	50 J 727009 6528999	6
	50 J 727090 6528924	5
<i>Hydrocotyle corynophora</i> (P1)	50 J 727317 6529031	115
	50 J 727075 6528968	45
	50 J 727320 6528912	3
	50 J 727392 6528982	55
	50 J 727367 6528879	70
	50 J 727390 6528719	130
	50 J 727377 6528730	25
	50 J 727331 6528868	2
	50 J 727365 6528757	200
	50 J 727368 6528781	150
	50 J 727305 6528891	70
	50 J 727358 6528298	1000
	50 J 727535 6528104	250
<i>Lepidosperma</i> aff. <i>fimbriatum</i> (Species of Interest)	50 J 727233 6529231	3
	50 J 727242 6529229	3
	50 J 727225 6529219	1
	50 J 727241 6529199	1
	50 J 727244 6529195	3
	50 J 727256 6529212	1
	50 J 727244 6529246	1
	50 J 727241 6529248	4
	50 J 727019 6529023	1
	50 J 727019 6529023	1
	50 J 727016 6529019	1
	50 J 727009 6528999	3
	50 J 727093 6528918	4
	50 J 727080 6528913	1
	50 J 727081 6528914	1

Significant Species	Location Coordinates	Number of Plants
<i>Lepidosperma</i> aff. <i>fimbriatum</i> (Species of Interest)	50 J 727082 6528913	1
----- Continued	50 J 727081 6528914	1
	50 J 727080 6528914	1
	50 J 727079 6528913	1
	50 J 727077 6528914	1
	50 J 727085 6528918	1
	50 J 727144 6528844	18
	50 J 727159 6528839	5
	50 J 727090 6528924	30
	50 J 727099 6528909	40
	50 J 727122 6528887	10
	50 J 727122 6528885	5
	50 J 727128 6528882	5
	50 J 727132 6528881	5
	50 J 727123 6528874	5
	50 J 727121 6528871	5
	50 J 727120 6528865	5
	50 J 727128 6528842	5
	50 J 727176 6528781	50
	50 J 727187 6528766	25
	50 J 727202 6528766	30
	50 J 727218 6528709	20
	50 J 727229 6528685	23
	50 J 727237 6528672	10
	50 J 727276 6528620	82
	50 J 727284 6528608	75
	50 J 727299 6528582	28
	50 J 727329 6528552	42
	50 J 727336 6528536	35
	50 J 727350 6528522	25
	50 J 727370 6528481	100
	50 J 727382 6528453	60
	50 J 727392 6528435	16
	50 J 727350 6528363	55
	50 J 727342 6528354	32
	50 J 727340 6528347	20
	50 J 727338 6528320	15
	50 J 727349 6528304	5
	50 J 727507 6528095	50
	50 J 727141 6528760	30

Significant Species	Location Coordinates	Number of Plants
<i>Lepidosperma</i> aff. <i>fimbriatum</i> (Species of Interest)	50 J 727125 6528756	30
----- Continued	50 J 727134 6528742	30
	50 J 727152 6528732	30
	50 J 727175 6528743	30
	50 J 727174 6528720	30
	50 J 727248 6528548	4
	50 J 727308 6528475	30
	50 J 727337 6528472	30
	50 J 727355 6528477	30
	50 J 727357 6528491	30
	50 J 727371 6528484	30
	50 J 727385 6528487	30
	50 J 727388 6528506	30
	50 J 727400 6528497	30
	50 J 727398 6528480	30
	50 J 727304 6528404	30
	50 J 727300 6528408	30
	50 J 727291 6528419	30
	50 J 727279 6528423	30
	50 J 727295 6528392	30
	50 J 727317 6528358	30
	50 J 727312 6528348	30
<i>Phlegmatospermum eremaeum</i> (P3)	50 J 727416 6529903	40
	50 J 727420 6529895	4
<i>Teucrium</i> sp. dwarf (R. Davis 8813) (P1)	50 J 728615 6529357	1



## **Appendix 4. Keighery Vegetation Condition Scale.**

**Keighery Vegetation Condition Scale developed by Keighery (1994) (as presented in Government of Western Australia (2000)).**

Pristine	Pristine or nearly so, no obvious signs of disturbance
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species
Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as "parkland cleared" with the flora comprising weed or crop species with isolated native trees or shrubs.



**Western  
Botanical**

**T** (08) 9274 0303  
**F** (08) 9274 0136

**E** [info@westernbotanical.com.au](mailto:info@westernbotanical.com.au)  
[www.westernbotanical.com.au](http://www.westernbotanical.com.au)