

**Flora Survey:  
Wonderlust Exploration Area,  
Medallion Metals**



**Report prepared for  
Medallion Metals  
April 2023**

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# 1 SUMMARY

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Medallion Metals are proposing to undertake mineral exploration at three prospect areas; NW Ariel, Happy Chappy, and Shintaro, all within the Wonderlust Project, located approximately 14 kilometres (km) south east of Ravensthorpe, Western Australia. The proposed exploration activities will follow existing and historical access tracks across the three prospect areas. Southern Ecology was engaged to assess a project envelope of 65.5 hectares (ha) (herein' the survey area) for vegetation and flora of conservation significance. The outcomes of the assessment are:

- Nine vegetation types were mapped within the survey area that align or have affinities with those previously described in the Ravensthorpe Range (Craig et al. 2008):
  - Heath and Mallee Heath
  - *Eucalyptus pleurocarpa*/ *Banksia media* (Eple/Bmed) (concordant with Kwongkan TEC)
  - Mallet Woodland
  - *Eucalyptus clivicola* (Ecli)
  - Mallee Scrub
  - *Eucalyptus* species/ *Melaleuca* species (Mallee/Mspp)
  - *Eucalyptus pileata* (Epil)
  - *Eucalyptus flocktoniae*/ *Melaleuca ulicifolia* (Eflo/Muli)
  - *Eucalyptus desmondensis*/ *Allocasuarina campestris* (Edes/Alca)
  - *Eucalyptus proxima*/ *Melaleuca* species (Epro/Mspp)
  - *Eucalyptus flocktoniae*/ *Melaleuca cucullata* (Eflo/Mcuc)
  - Melaleuca Shrublands
  - *Melaleuca elliptica* (Mell)
- One vegetation association (Eple/Bmed) is concordant with the “*Proteaceae Dominated Kwongkan Shrublands*” Threatened Ecological Community, listed as ‘Endangered’ under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).
- A total of 196 species from 41 families were recorded within the survey area. Eight of the native flora taxa identified are listed by the Department of Biodiversity and Conservation (DBCA) as Priority flora:
  - *Lepidosperma* sp. Elverdton (R. Jasper et al. LCH 16844) (P1)
  - *Lepidosperma* sp. Mt Short (S. Kern et al. LCH 17510) (P1)
  - *Hydrocotyle tuberculata* (P2)
  - *Acacia errabunda* (P3)
  - *Grevillea punctata* (P3)
  - *Eucalyptus desmondensis* (P4)
  - *Melaleuca penicula* (P4)
  - *Pultenaea brachyphylla* (P2)

## 2 INTRODUCTION

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### 2.1 Background

Medallion Metals are proposing to undertake mineral exploration at three prospect areas; NW Ariel, Happy Chappy, and Shintaro within the Wonderlust Project, located approximately 14 kilometres (km) south east of Ravensthorpe, Western Australia. The proposed exploration activities will involve disturbance of existing and historic access tracks across the three prospect areas. Southern Ecology was engaged to assess a survey area encompassing a 50 meter (m) wide corridor along existing or historical tracks, with the total extent of the survey area encompassing 65.5 hectares (ha). The survey area was assessed for flora and vegetation of conservation significance.

### 2.2 Scope of Works

The scope of works was to undertake the following:

- A desktop review of conservation significant vegetation, flora and fauna (data provided by Department of Biodiversity Conservations and Attractions [DBCA]) and other environmental values within a 10 km radius of the survey area.
- A targeted survey for conservation significant flora.
- An assessment of vegetation type and condition using relevés.
- Identify and map the presence of any threatened ecological communities (TECs) and/or priority ecological communities (PECs).
- Record and map the presence of Weeds of National Significance (WoNS) or Declared Pests (DP) (if encountered).

### 2.3 Physical and Biological Environment

#### 2.3.1 Interim Biogeographic Regionalisation for Australia

The Interim Biogeographic Regionalisation for Australia (IBRA version 7) divides the Australian continent into 89 large geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information. The survey area is located within the Esperance Plains Interim Biogeographic Regionalisation of Australia (IBRA) Region and Fitzgerald Subregion (Department of Climate Change, Energy, Environment and Water [DCCEEW] 2022).

#### 2.3.2 Vegetation, Flora and Weeds

Broad scale pre-European vegetation mapping (Shepherd *et al.* 2002) indicates that the native vegetation of the area is composed of:

- “Mallee. Eucalypt shrubland *Eucalyptus eremophila*, *E. redunca*, *E. spp.*” (Vegetation Association 516).

The survey area occurs within part of the Ravensthorpe Range where regional vegetation mapping has previously been undertaken (Craig *et al.* 2008), which identifies the occurrence of approximately 19 vegetation units within the survey area.

No weeds listed as a Weed of National Significance (WoNS) (Weeds Australia 2022) or as declared pests in Western Australian under the BAM Act (Department of Primary Industries and Regional Development [DPIRD] 2022a) are known from the survey area. However, Bridal Creeper and Two-leafed Cape Tulip (WoNS) is known to occur within the Steere River catchment (Rathbone 2023).

### **2.3.3 Hydrological features**

No Wetlands of International Importance (i.e., Ramsar wetlands) or Nationally Important Wetlands occur within 10 km of the survey area. The nearest conservation significant wetland is the Culham Inlet system (Nationally Important Wetland) that occurs approximately 27 km to the south. The survey area lies within the Culham Inlet / Phillips / West Steere catchment area and the Phillips River sub-catchment (DPIRD 2022b).

### **2.3.4 Land Systems and Soils**

One soil-landscape system within one soil-landscape zone have been mapped within the survey area (DPIRD 2022b):

**Ravensthorpe Zone**: Rolling low hills on greenstone (mafic and ultramafic). Moderately dissected with south-flowing rivers. Red fine-textured soils.

- Kybulup System

Undulating low hills and rises on weathered granite and gneiss, in the Ravensthorpe Zone, with alkaline shallow loamy duplex (red and grey), grey shallow sandy duplex and non-cracking clay. Mallee scrub.

### **2.3.5 Conservation Reserves**

No conservation reserves currently occur within the survey area. The nearest conservation reserves include the Kundip Nature Reserve approximately 5.5 km to the south and the Fitzgerald River National Park approximately 18 km to the south southeast and (DCCEEW 2022).



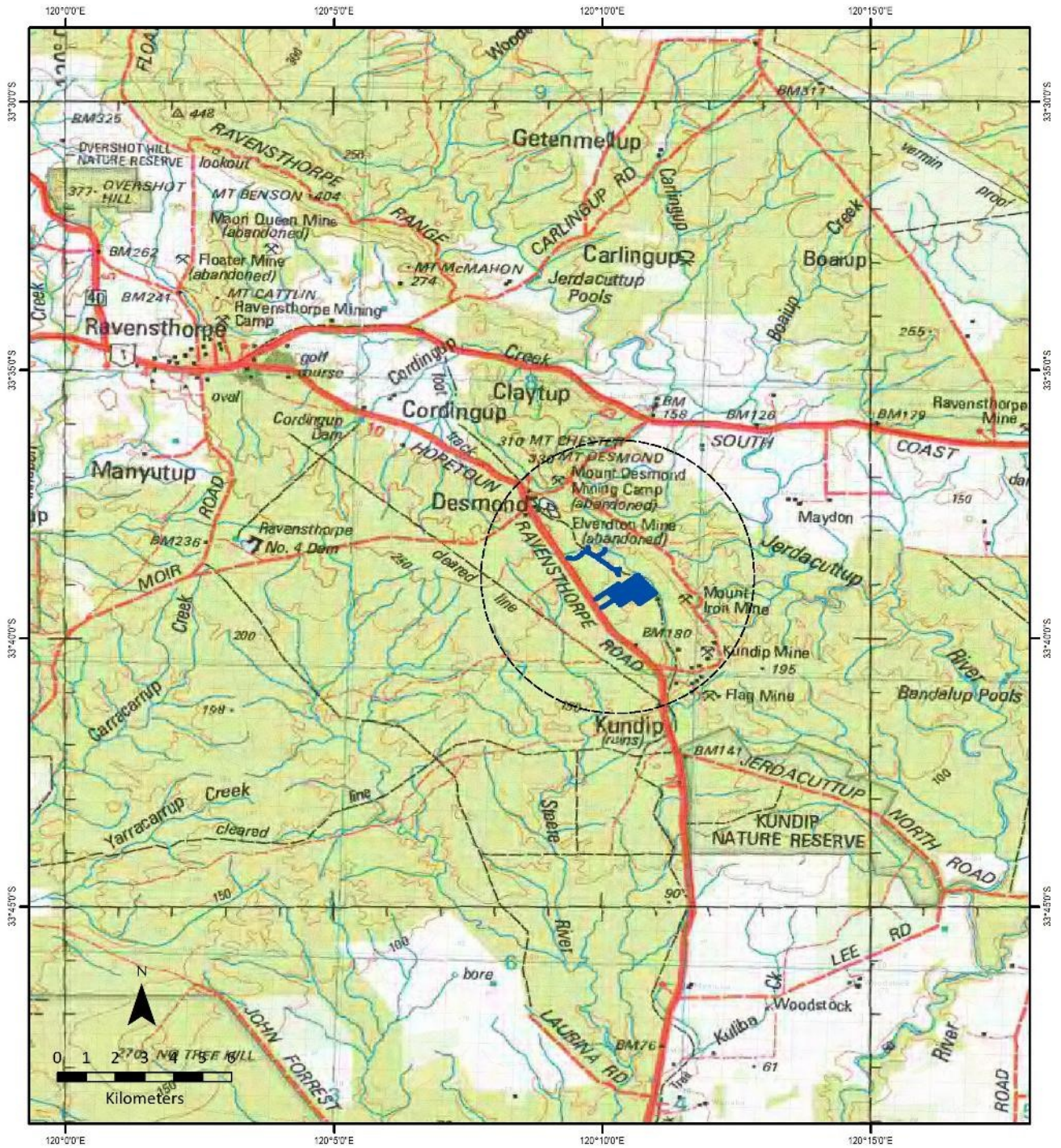


Figure 1. Location of the survey area (blue polygons).

## 3 METHODS

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### 3.1 Personnel

The biological survey (desktop and field assessment) was conducted by Damien Rathbone (BSc Hons Plant Science, Scientific License 012382).

Damien Rathbone has over 16 years of experience conducting biological surveys in southern Western Australia. Within the south coast region, he has previously undertaken DBCA regional surveys (Albany Regional Vegetation Survey, Fitzgerald River National Park Flora Survey, Ravensthorpe Range Flora Survey), threatened species survey and recovery implementation and has 10 scientific publications. Damien is also an accredited interpreter for dieback assessments on DBCA estate (Accreditation PDI-032).

### 3.2 Desktop Assessment

A desktop assessment of known or potential conservation significant flora and vegetation within a 10 km radius of the survey area was undertaken using the following sources:

- Threatened and Priority flora records from the Department of Biodiversity, Conservation and Attractions [DBCA] and/or the Western Australian Herbarium.
- Protected Matters Search Tool (PMST) (DCCEEW 2022).
- Priority Ecological Community (PEC) and Threatened Ecological Community (TEC) mapping from the Species and Communities Branch, DBCA (DBCA 2019).
- Previous environmental surveys in the vicinity (Craig 2004, Craig et al. 2008, Craig 2012, Rathbone 2019, Rathbone et al. 2020)

Prior to conducting the survey, the records returned from the database searches were assessed for their spatial accuracy. All valid species recorded were reviewed to determine key morphological characteristics, flowering times, suitable habitats and the likelihood of occurrence in the survey area.

Following the survey, all conservation significant flora species identified in the database searches were again assessed to determine the suitability of habitats derived from the current survey and the effectiveness of the survey effort and timing (post-survey likelihood of occurrence, Appendix D).

### 3.3 Field Assessment

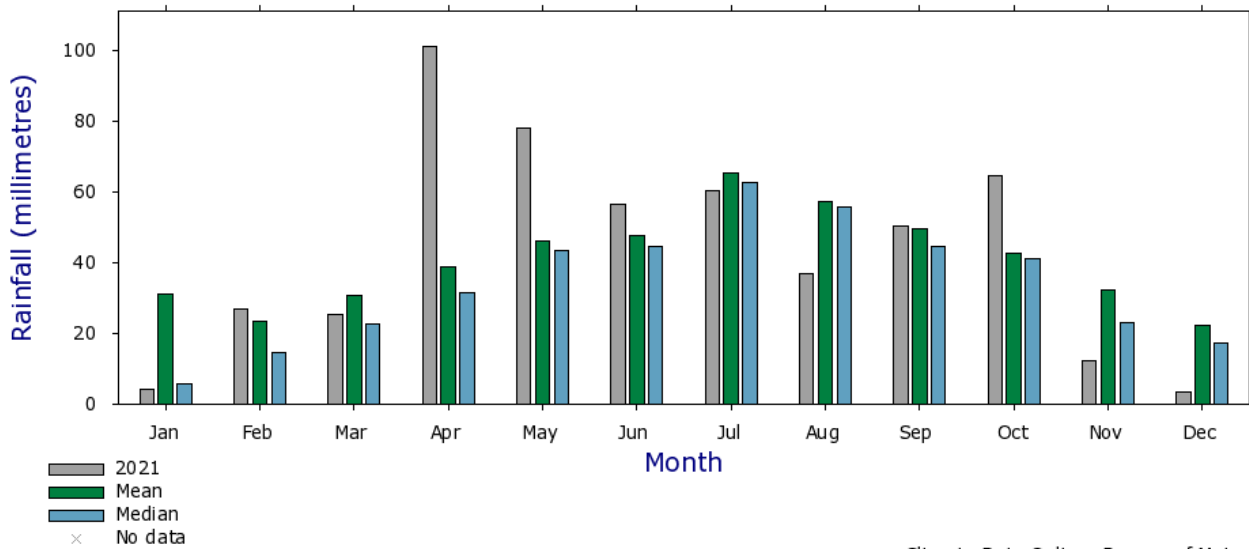
#### 3.3.1 *Schedule*

The field assessment of the survey area was undertaken over one week in Spring (8<sup>th</sup> -17<sup>th</sup> of September 2021). The timing of the field assessment is considered appropriate for survey within the bioregion (Esperance Plains).

#### 3.3.2 *Weather*

Daily weather observations recorded from Hopetoun North were used to describe local rainfall and temperatures preceding the survey (Figure 2).

Hopetoun North (009961) 2021 Rainfall (millimetres)



Note: Data may not have completed quality control

Climate Data Online, Bureau of Meteorology  
Copyright Commonwealth of Australia, 2023

Rainfall statistics for 2021 compared with historic averages (all years available) from the nearest weather station (Hopetoun North) (BOM 2023).

### 3.3.3 Vegetation Assessment

The survey was undertaken in accordance with requirements of the EPA guidance documents (EPA 2016). Information acquired during the desktop review assisted in the design of the field survey. Pre-survey planning involved the examination of 1:5,000 scale orthophotos, soil and topography layers and existing records of conservation significant flora and vegetation.

The survey area was traversed by foot and vehicle and a vegetation assessment was conducted using opportunistic relevés where the following attributes were recorded:

- Location and site description – GPS coordinate (GDA 94 MGA Zone 51).
- Species inventory – dominant vascular plant species present, including weed species. Species that were not confidently identified during the field survey were collected for identification in the Albany Regional Herbarium or Western Australian Herbarium.
- Foliar cover – the estimated percentage cover for each stratum (upper, middle, ground).
- Vegetation condition – according to the current vegetation condition classification (Table 1).
- Photographs – landscape or panorama photographs overlooking the surrounding vegetation.

Relevé information was used to define the vegetation association according to the National Vegetation Information System (NVIS Technical Working Group 2017) and were then manually aligned with regional mapping units (Craig *et al.* 2008). The extent of these vegetation types was then extrapolated using aerial photography (in an ARCGIS environment) and partial ground truthing.



**Table 1. Vegetation condition scale (EPA 2016).**

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

### **3.3.4 Targeted Flora Survey**

A targeted search for potential Threatened and Priority flora identified from the desktop assessment was conducted across the survey area. Population census and site information of Threatened or Priority flora was recorded in accordance with the Threatened & Priority Flora (TPFL) Database Manual (Department of Environment and Conservation [DEC] 2010). Population size was determined by either direct counts, or by estimation of plant density using transects or suitably sized quadrats. All coordinates and mapping were measured using a GPS unit (Garmin Oregon 7000,  $\pm 5\text{m}$  accuracy) (MGA zone 51, GDA94).



### 3.3.5 Survey Limitations

In accordance with the EPA (2016) document *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment*, an assessment of potential survey limitations was undertaken (Table 2). No avoidable limitations were identified that can be expected to have affected the reliability of the results of the field survey.

Plant populations can fluctuate over time, particularly after disturbance events such as fire and drought. Consequently, all mapping, vegetation descriptions and population estimates within this report should not be considered accurate indefinitely.

**Table 2. Assessment of potential survey limitations (EPA 2016).**

Potential for Limitation	Assessment
Availability of contextual information	Regional vegetation mapping and flora/fauna records were available to allow for a moderate level of contextual information prior to the field survey. The availability of accurate population census data is limited for many conservation significant flora, which restricts the assessment of significance. For many DBCA listed Priority flora no population level information is known (due to absence of survey effort) and/or the DBCA do not make detailed information practically available for environmental consultants.
Personnel experience	Personnel undertaking the survey have in excess of 10 years' experience within southern bioregions of WA.
Proportion of flora recorded or identification issues	All taxa were sufficiently identified to species level. Identification of <i>Lepidosperma</i> species is complex due to subtle taxonomic separations between some taxa and incomplete descriptions of phrase name species. All effort was made by the authors to correctly identify species. However, future changes in taxonomy and conservation significance are likely to occur in this group.  The level of survey conducted was a Targeted Flora Survey (EPA 2016). A detailed floristic survey using quadrats would increase the number of taxa recorded from the survey area and would provide greater clarity of vegetation types and threshold cover values to define the Proteaceae Dominated Kwongkan Shrublands TEC.
Extent of survey and site access	The area of survey was a relatively long, narrow corridor; the survey period was adequate to conduct a single traverse of the survey area. However, the efficacy of survey was reduced in areas of dense vegetation.
Survey timing	The survey timing was in spring, which is considered appropriate for botanical surveys in this bioregion. However, not all taxa can be guaranteed to flower or emerge within this period. Appendix D assessed the flowering times and emergence of annual species of potential conservation significance, indicating no species from the desktop assessment are likely to have been missed due to seasonal timing.
Seasonal conditions	Whilst below average rainfall has occurred for the year to date, this was counteracted by close to average rainfall preceding the survey in July/August such that the seasonal conditions were considered appropriate for recording the flora values present (Figure 2).
Disturbances	The time since previous fire is >10 years within the main survey area, therefore is not expected to have generally affected the recording of biological values present. Some fire ephemerals that only emerge shortly after fire may not have been detected.

## 4 RESULTS & DISCUSSION

### 4.1 Desktop Assessment

#### Flora

The desktop assessment identified that 76 conservation significant flora have previously been recorded in the vicinity (< 10 km) of the survey area or may occur. A post-survey likelihood of occurrence assessment of conservation significant flora (Appendix D) was undertaken following the field visits to determine the suitability of habitats derived from the field survey and the effectiveness of the survey effort and timing. The assessment determined the following conclusions about the survey area:

- Seven species identified in the desktop assessment were recorded in the survey area.
- Five priority-listed *Lepidosperma* species and two *Austrostipa* species remain 'possible' to occur. Generally due their cryptic taxonomy and difficulty to detect if in low numbers.
- *Goodenia phillipsiae* (P4) remains 'possible' to occur. This is a relatively widespread taxon, but would be difficult to detect if not flowering.
- Thirty-seven species were considered 'unlikely' to occur as either limited suitable habitat was present, or the survey effort and timing was sufficient to confirm their absence from the survey area.

#### Vegetation

The desktop assessment determined that one Threatened Ecological Community may be present: "*Proteaceae Dominated Kwongkan Shrublands*" (Endangered) (DoE 2014), which was found to occur within the survey area (see section 4.2).

The extents and reservation status of broad-scale regional vegetation mapping within the survey area is presented in Table 3. One association is present, which is currently above the 30% threshold of remaining extent within the Esperance Plains IBRA region. Of the total area of Pre-European Extent within the bioregion, 28.36% is represented in the reservation system.

Table 3. Extent of Pre-European vegetation in the survey area (GoWA 2019).

Vegetation Association	Description	Pre-European Extent Statewide (ha)	Pre-European Extent in bioregion (ha)	Current extent in bioregion (ha)	Proportion of Pre-European extent remaining in bioregion (%)	% Current extent in formal protection in bioregion (proportion of Pre-European Extent)
Mallee (516)	"Mallee. Eucalypt shrubland <i>Eucalyptus eremophila</i> , <i>E. redunca</i> , <i>E. spp.</i> "	607,434.08	318,746.74	219,798.44	68.96	28.36

## 4.2 Vegetation

The survey area was delineated into nine vegetation types (Table 4), which are described in section 4.3 and mapped in Appendix B. The vegetation was generally in Excellent condition, with the exception of small areas of slashed vegetation adjacent to the highway that were considered to be in Very Good condition. Invasion of weeds was minimal; with one weed species recorded (*Lysimachia arvensis*).

The regional extent of the vegetation types was determined by comparison with the mapping units from the Ravensthorpe Range (Craig et al. 2008). All of the vegetation types could be assigned as analogous or to show affinities to previously known regional mapping units.

One vegetation type (*Eucalyptus pleurocarpa/ Banksia media*) is concordant within the “*Proteaceae Dominated Kwongkan Shrublands*” Threatened Ecological Community, which is listed as ‘Endangered’ under the EPBC Act 1999 (DotE 2014). This TEC is defined by a threshold structural component of shrubs from the Proteaceae family, which can be spatially and temporally variable. Some occurrences of this TEC within the Survey were mapped as ‘possible’, in accordance with Index of Biodiversity Surveys for Assessments (IBSA) standards, which could be confirmed by assessment with floristic quadrats.

**Table 4. Area of extent (ha) of vegetation types within the survey area. The majority of vegetation occurs in Excellent condition (EPA 2016).**

Vegetation Type	Condition (EPA 2016)		Total (ha)
	Very Good	Excellent	
<u>Heath and Mallee Heath</u> <i>Eucalyptus pleurocarpa/ Banksia media</i> (Eple/Bmed) (TEC)	0.18	10.04	10.22
<u>Mallet Woodland</u> <i>Eucalyptus clivicola</i> (Ecli)		7.83	7.83
<u>Mallee Scrub</u> <i>Eucalyptus species/ Melaleuca species</i> (Mallee/Mspp)	<0.00	11.01	11.01
<i>Eucalyptus pileata</i> (Epil)		0.62	0.62
<i>Eucalyptus flocktoniae/ Melaleuca ulicifolia</i> (Eflo/Muli)	0.09	2.08	2.17
<i>Eucalyptus desmondensis/ Allocasuarina campestris</i> (Edes/Alca)		7.32	7.32
<i>Eucalyptus proxima/ Melaleuca species</i> (Epro/Mspp)		17.11	17.11
<i>Eucalyptus flocktoniae/ Melaleuca cucullata</i> (Eflo/Mcuc)	<0.00	8.77	8.77
<u>Melaleuca Shrublands</u> <i>Melaleuca elliptica</i> (Mell)		0.15	0.15
<b>Total</b>	<b>0.28</b>	<b>64.93</b>	<b>65.21</b>

## 4.3 Vegetation Descriptions

### 1. *Eucalyptus pleurocarpa* / *B. media* Mallee Heath (Eple/Bmed) (TEC)

**Relevés:** 104, 107, 108, 116, 117

**Soil:** orange duplex, orange sand over clay duplex, grey sandy clay, yellow sand, orange sand

**Rock:** quartz and ironstone, quartz and ironstone gravel, outcrop schist, quartz gravel

**Landform:** NA

**Species Richness:** Average: 25.6, Min: 18 Max: 42

**Conservation Significant Flora:** *Hydrocotyle tuberculata* (P2), *Grevillea punctata* (P3), *Lepidosperma* sp. Mt Short (S. Kern et al. LCH 17510) (P1).

**Condition:** Excellent

**Regional Extent:** Concordant with Unit 55 (Craig et al. 2008), which has a total of 332.8 ha mapped in the Ravensthorpe Range.

TEC

#### Floristics:

Layer	Height/cover	Dominant taxa
Upper	4m, <10%	<i>Eucalyptus pleurocarpa</i> , <i>Eucalyptus tetraptera</i> , <i>Eucalyptus suggrandis</i> , <i>Eucalyptus phaenophylla</i> , <i>Eucalyptus leptocalyx</i>
Middle	2m, 10-30%; 30-70%	<i>Tetrapora verrucosa</i> , <i>Melaleuca rigidifolia</i> , <i>Hakea marginata</i> , <i>Beaufortia schaueri</i> , <i>Banksia media</i>
Ground	0.5m, 10-30%	<i>Lomandra micrantha</i> subsp. <i>teretifolia</i> , <i>Lepidosperma tuberculatum</i> , <i>Patersonia occidentalis</i> , <i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)



Plate 1. *Eucalyptus pleurocarpa* / *B. media* Mallee Heath (Eple/Bmed).



## **2. *Eucalyptus clivicola* Mallet Woodland (Ecli)**

**Relevés:** 110

**Soil:** dark brown loam

**Rock:** nil

**Landform:** NA

**Species Richness:** Average: 15, Min: 15 Max: 15

**Conservation Significant Flora:** -

**Weeds:** -

**Condition:** Excellent

**Regional Extent:** Concordant with Unit 14 (Craig et al. 2008), which has a total of 465.2 ha mapped in the Ravensthorpe Range.

**Floristics:**

Layer	Height/cover	Dominant taxa
Upper	8m, 30-70%	<i>Eucalyptus platypus</i> , <i>Eucalyptus clivicola</i>
Middle	2m, <10%	<i>Verticordia chrysantha</i> , <i>Petrophile fastigiata</i> , <i>Melaleuca acuminata</i> , <i>Lasiopetalum indutum</i> , <i>Hakea laurina</i>
Ground	0.5m, <10%	<i>Thysanotus patersonii</i> , <i>Lepidosperma</i> sp. Ravensthorpe (G.F. Craig 5188), <i>Lepidosperma sanguinolentum</i>



**Plate 2. *Eucalyptus clivicola* Mallet Woodland (Ecli).**

### **3. *Eucalyptus desmondensis*/ *Allocasuarina campestris* Mallee Scrub (Edes/Alca)**

**Relevés:** 103, 119

**Soil:** orange clay

**Rock:** granitic and lateritic gravel

**Landform:** NA

**Species Richness:** Average: 13, Min: 12 Max: 14

**Conservation Significant Flora:** *Lepidosperma* sp. Mt Short (S. Kern et al. LCH 17510) (1), *Eucalyptus desmondensis* (4)

**Weeds:** -

**Condition:** Excellent

**Regional Extent:** Concordant with Unit 44 (Craig et al. 2008), which has a total of 159.6 ha mapped in the Ravensthorpe Range.

#### **Floristics:**

<b>Layer</b>	<b>Height/cover</b>	<b>Dominant taxa</b>
Upper	4m, 10-30%	<i>Eucalyptus desmondensis</i>
Middle	2m, 10-30%	<i>Melaleuca hamata</i> , <i>Kunzea affinis</i> , <i>Allocasuarina campestris</i> , <i>Petrophile fastigiata</i> , <i>Melaleuca rigidifolia</i>
Ground	<0.5m, 10-30%	<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510), <i>Stylidium spinulosum</i> , <i>Stylidium breviscapum</i> , <i>Drosera glanduligera</i>



**Plate 3. *Eucalyptus desmondensis*/ *Allocasuarina campestris* Mallee Scrub (Edes/Alca).**



#### **4. *Eucalyptus flocktoniae*/ *Melaleuca cucullata* Mallee Scrub (Eflo/Mcuc)**

**Relevés:** 114, 115

**Soil:** orange clay

**Rock:** nil, quartz and granitic gravel

**Landform:** NA

**Species Richness:** Average: 11, Min: 9 Max: 13

**Conservation Significant Flora:** *Hydrocotyle tuberculata* (P2).

**Weeds:** \**Lysimachia arvensis*

**Condition:** Excellent

**Regional Extent:** Concordant with Unit 53 (Craig et al. 2008), which has a total of 108.6 ha mapped in the Ravensthorpe Range.

#### **Floristics:**

<b>Layer</b>	<b>Height/cover</b>	<b>Dominant taxa</b>
Upper	4m, <10%	<i>Eucalyptus phenax</i> , <i>Eucalyptus proxima</i> , <i>Eucalyptus calycogona</i>
Middle	3m, >70%	<i>Melaleuca cucullata</i> , <i>Acacia glaucoptera</i> , <i>Templetonia retusa</i> , <i>Senna artemisioides</i> , <i>Melaleuca hamata</i>
Ground	<0.5m, <10%	<i>Ptilotus spathulatus</i> , <i>Oxalis exilis</i> , * <i>Lysimachia arvensis</i> , <i>Lepidosperma</i> sp. Ravensthorpe (G.F. Craig 5188), <i>Hydrocotyle tuberculata</i>



**Plate 4. *Eucalyptus flocktoniae*/ *Melaleuca cucullata* Mallee Scrub (EfloMcuc).**



### **5. *Eucalyptus flocktoniae*/ *Melaleuca ulicifolia* Mallee Scrub (Eflo/Muli)**

**Relevés:** 101

**Soil:** light brown clay

**Rock:** quartz and iron gravel

**Landform:** NA

**Species Richness:** Average: 28, Min: 28 Max: 28

**Conservation Significant Flora:** -

**Weeds:** -

**Condition:** Excellent

**Regional Extent:** Concordant with Unit 36 (Craig et al. 2008), which has a total of 188.04 ha mapped in the Ravensthorpe Range.

#### **Floristics:**

<b>Layer</b>	<b>Height/cover</b>	<b>Dominant taxa</b>
Upper	4m, 10-30%	<i>Eucalyptus uncinata</i> , <i>Eucalyptus suggrandis</i> , <i>Eucalyptus flocktoniae</i> , <i>Eucalyptus cernua</i> , <i>Eucalyptus calycogona</i>
Middle	1.5m, 10-30%	<i>Pultenaea purpurea</i> , <i>Melaleuca subfalcata</i> , <i>Melaleuca ulicifolia</i> or <i>marginata</i> , <i>Melaleuca lateriflora</i> , <i>Melaleuca hamata</i>
Ground	<0.5m, <10%	<i>Thysanotus patersonii</i> , <i>Neurachne alopecuroidea</i> , <i>Lepidosperma tuberculatum</i> , <i>Lepidosperma gahnioides</i> , <i>Gahnia aristata</i>



**Plate 5. *Eucalyptus flocktoniae*/ *Melaleuca ulicifolia* Mallee Scrub (Eflo/Muli).**

## **6. *Eucalyptus pileata* Mallee Scrub (Epil)**

**Relevés:** 109

**Soil:** grey sandy clay

**Rock:** granitic gravel

**Landform:** NA

**Species Richness:** Average: 14, Min: 14 Max: 14

**Conservation Significant Flora:** -

**Weeds:** -

**Condition:** Excellent

**Regional Extent:** Concordant with Unit 23 (Craig et al. 2008), which has a total of 50.5 ha mapped in the Ravensthorpe Range

### **Floristics:**

<b>Layer</b>	<b>Height/cover</b>	<b>Dominant taxa</b>
Upper	5m, 10-30%	<i>Eucalyptus proxima</i> , <i>Eucalyptus pileata</i> , <i>Eucalyptus leptocalyx</i> , <i>Eucalyptus flocktoniae</i>
Middle	3m, 30-70%	<i>Melaleuca pauperiflora</i> , <i>Melaleuca marginata</i> , <i>Melaleuca hamata</i> , <i>Melaleuca cucullata</i> , <i>Hakea commutata</i>
Ground	0.5m, 10-30%	<i>Lepidosperma</i> sp. <i>Ravensthorpe</i> (G.F. Craig 5188)



**Plate 6. *Eucalyptus pileata* Mallee Scrub (Epil) Note: Photo taken in ecotonal zone.**



## **7. *Eucalyptus proxima*/ *Melaleuca* species Mallee Scrub (Epro/Mspp)**

**Relevés:** 105, 118, 120

**Soil:** orange clay, orange and brown clay, grey sandy clay

**Rock:** granitic rock, granitic gravel, granitic and quartz gravel

**Landform:** NA

**Species Richness:** Average: 28, Min: 22 Max: 36

**Conservation Significant Flora:** *Acacia errabunda* (P3)

**Weeds:** -

**Condition:** Excellent

**Regional Extent:** Concordant with Unit 46 (Craig et al. 2008), which has a total of 97.2 ha mapped in the Ravensthorpe Range.

### **Floristics:**

<b>Layer</b>	<b>Height/cover</b>	<b>Dominant taxa</b>
Upper	4m, 10-30%	<i>Eucalyptus flocktoniae</i> , <i>Eucalyptus proxima</i> , <i>Eucalyptus uncinata</i> , <i>Eucalyptus suggrandis</i> , <i>Eucalyptus phenax</i>
Middle	1.5m, 30-70%	<i>Melaleuca lateriflora</i> , <i>Melaleuca rigidifolia</i> , <i>Melaleuca hamata</i> , <i>Leucopogon infuscatus</i> , <i>Exocarpos aphyllus</i>
Ground	0.5m, 10-30%	<i>Lepidosperma gahnioides</i> , <i>Ozothamnus lepidophyllus</i> , <i>Lepidosperma tuberculatum</i> , <i>Lepidosperma fimbriatum</i> , <i>Glischrocaryon roei</i>



**Plate 7. *Eucalyptus proxima*/ *Melaleuca* species Mallee Scrub (Epro/Mspp).**

## **8. Eucalyptus species/ Melaleuca species Mallee Scrub (Mallee/Mspp)**

**Relevés:** 106, 111, 112, 113

**Soil:** orange clay, grey sand, orange and brown sandy clay

**Rock:** quartz and ironstone, granitic gravel, laterite gravel, quartz and granitic gravel

**Landform:** NA

**Species Richness:** Average: 19, Min: 15 Max: 25

**Conservation Significant Flora:** *Lepidosperma* sp. Mt Short (S. Kern et al. LCH 17510) (P1)

**Weeds:** -

**Condition:** Excellent

**Regional Extent:** Concordant with Unit 20 (Craig et al. 2008), which has a total of 397.8 ha mapped in the Ravensthorpe Range.

### **Floristics:**

<b>Layer</b>	<b>Height/cover</b>	<b>Dominant taxa</b>
Upper	3m, 10-30%	<i>Eucalyptus flocktoniae</i> , <i>Eucalyptus phenax</i> , <i>Eucalyptus phaenophylla</i> , <i>Eucalyptus uncinata</i> , <i>Eucalyptus sporadica</i>
Middle	1- 2m, 30-70%	<i>Melaleuca hamata</i> , <i>Tetrapora verrucosa</i> , <i>Melaleuca rigidifolia</i> , <i>Hibbertia acerosa</i> , <i>Gastrolobium musaceum</i>
Ground	0.5m, 10-30%	<i>Gahnia ancistrophylla</i> , <i>Netrostylis</i> sp. Mt Madden (C.D. Turley 40 BP/897), <i>Stylidium piliferum</i> , <i>Stylidium breviscapum</i>



**Plate 8. Eucalyptus species/ Melaleuca species Mallee Scrub (Mallee/Mspp).**



### **9. Melaleuca elliptica Shrubland (Mell)**

**Relevés:** 102

**Soil:** orange clay

**Rock:** quartz and granitic

**Landform:** NA

**Species Richness:** Average: 22, Min: 22 Max: 22

**Conservation Significant Flora:** *Grevillea punctata* (P3), *Lepidosperma* sp. Mt Short (S. Kern et al. LCH 17510) (P1)

**Weeds:** -

**Condition:** Excellent

**Regional Extent:** Concordant with Unit 49 (Craig et al. 2008), which has a total of 2.3 ha mapped in the Ravensthorpe Range.

#### **Floristics:**

<b>Layer</b>	<b>Height/cover</b>	<b>Dominant taxa</b>
Upper	4m, 10-30%	<i>Eucalyptus sporadica</i> , <i>Eucalyptus pleurocarpa</i>
Middle	1.5m, 30-70%	<i>Petrophile fastigiata</i> , <i>Melaleuca rigidifolia</i> , <i>Melaleuca hamata</i> , <i>Melaleuca elliptica</i> , <i>Leucopogon concinnus</i>
Ground	0.5m, 10-30%	<i>Stylidium diversifolium</i> , <i>Spartochloa scirpoidea</i> , <i>Lepidosperma</i> sp. Ravensthorpe (G.F. Craig 5188), <i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)



**Plate 10. *Melaleuca elliptica* Shrubland (Mell).**

## 4.4 Flora

The field assessment identified a total of 196 species from 41 families, within the survey area (Appendix C). The most species rich families were Myrtaceae (49), Fabaceae (29), Proteaceae (19) and Cyperaceae (15), which is typical of the region. Average species richness in each relevé was =  $20.6 \pm 1.8$  (S.E.).

Of the native flora identified in the survey area, seven are listed by DBCA as Priority flora:

- *Acacia errabunda* (P3)
- *Eucalyptus desmondensis* (P4)
- *Grevillea punctata* (P3)
- *Hydrocotyle tuberculata* (P2)
- *Lepidosperma* sp. Elverdton (R. Jasper et al. LCH 16844) (P1)
- *Lepidosperma* sp. Mt Short (S. Kern et al. LCH 17510) (P1)
- *Melaleuca penicula* (P4)
- *Pultenaea brachyphylla* (P2)

Each taxon is discussed below and their distribution within the survey mapped in Appendix B.

### ***Acacia errabunda* (P3)**

*Acacia errabunda* is a 'Priority Three' flora from the Fabaceae family. It is currently known from 25 records across an east-west range of approximately 250 km, from Broomehill in the west across to Ravensthorpe in the east (WAH 1998-). The nearest record to the survey area is approximately 5 km to the north west along the Hopetoun-Ravensthorpe road. Within the survey area, *Acacia errabunda* found from one population of five plants.



Plate 11. *Acacia errabunda* (P3).

***Eucalyptus desmondensis* (P4)**

*Eucalyptus desmondensis* is a Priority 4 flora from the Myrtaceae. It is currently known from 66 records over a range of 43 km in the Ravensthorpe (WAH 1998-). Within the survey area, approximately 320 individuals of *Eucalyptus desmondensis* were recorded.



Plate 12. *Eucalyptus desmondensis* (P4).

***Grevillea punctata* (P3)**

*Grevillea punctata* is a Priority 3 flora from the Proteaceae. It is currently known from 28 records over an east-west range of approximately 45 km mostly to the south of Ravensthorpe (WAH 1998-). The nearest records to the survey area are approximately 3 km to the north-east. Within the survey area, one population with 11 individuals was recorded.



Plate 13. *Grevillea punctata* (P3).



***Hydrocotyle tuberculata* (P2)**

*Hydrocotyle tuberculata* is a Priority 2 flora from the Araliaceae. It is currently known from 5 records over a range of approximately 250 km from Mount Ridley in the east across to Fitzgerald River National Park in the west (WAH 1998-). The closest known record to the survey area is approximately 2 km south-east of the survey area site. Within the survey area six colonies of *Hydrocotyle tuberculata* were recorded, each with ten or more individuals.



Plate 14. *Hydrocotyle tuberculata* (P2).

***Melaleuca penicula* (P4)**

*Melaleuca penicula* is a Priority 4 flora from the Myrtaceae. It is currently known from 21 records over an east-west range of approximately 85 km from the Fitzgerald River in the west, to 30 km north and east of Ravensthorpe (WAH 1998-). The nearest record to the survey area is approximately 11 km to the north west. Within the survey area, seven individuals of *Melaleuca penicula* were recorded in one location.



Plate 15. *Melaleuca penicula* (P4) (H. Hughes, R. Jasper and S. Kern WAH 1998-).

### ***Lepidosperma* species (P1)**

Two Priority 1 listed *Lepidosperma* species were recorded: *Lepidosperma* sp. Elverdton (R. Jasper et al. LCH 16844) and *Lepidosperma* sp. Mt Short (S. Kern et al. LCH 17510).

The taxonomy of the *Lepidosperma* species is incomplete and it is difficult to differentiate between many of the “phrase named” *Lepidosperma* taxa recognised by Barrett et al. (2009 and 2012), including several that are on DBCA’s Priority flora list. It is particularly challenging to adequately identify these taxa when in the field and undertake an accurate population census. Close examination and field observation suggest the two entities recorded in this survey may be one taxon that represent either large (*Lepidosperma* sp. Elverdton (R. Jasper et al. LCH 16844)) or small (*Lepidosperma* sp. Mt Short (S. Kern et al. LCH 17510)) ecotypes, depending on site productivity. Consequently, these two Priority listed *Lepidosperma* species have been identified in this report to be present within the survey area. However, further assessment would be required to accurately the map the population distribution and undertake of each separate taxon. Population census information is indicative only.



Plate 16. *Lepidosperma* sp. Elverdton (R. Jasper et al. LCH 16844).

### ***Pultenaea brachyphylla* (P2)**

*Pultenaea brachyphylla* is a Priority 2 flora from the Fabaceae. It is currently known from 21 records over an east-west range of approximately 200 km Bremer Bay to Esperance (WAH 1998-). Within the survey area, five individuals not flowering were recorded in one location (firebreak adjacent to Hopetoun Ravensthorpe Road).

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## 6 APPENDIX A - Conservation Status Definitions

**Table A1. Acts used in environmental impact assessment.**

<i>Environment Protection and Biodiversity Conservation [EPBC] Act 1999</i>	<a href="https://www.legislation.gov.au/Details/C2016C00777">https://www.legislation.gov.au/Details/C2016C00777</a>
<i>Environmental Protection [EP] Act 1986</i>	<a href="https://www.slp.wa.gov.au/legislation/statutes.nsf/law_a252.html">https://www.slp.wa.gov.au/legislation/statutes.nsf/law_a252.html</a>
<i>Biodiversity Conservation [BC] Act 2016</i>	<a href="https://www.slp.wa.gov.au/legislation/statutes.nsf/law_a147120.html">https://www.slp.wa.gov.au/legislation/statutes.nsf/law_a147120.html</a>

**Table A2. The categories for flora and fauna listed as Threatened or specially protected. Taxa can be recognised as Threatened (T) or Conservation Dependent under Federal (EPBC) and / or State (BC) Acts.**

Threat category	Definition
Threatened - Critically Endangered (T-CR)	Considered to be facing an extremely high risk of extinction in the wild
Threatened – Endangered (T-EN)	Considered to be facing a very high risk of extinction in the wild
Threatened – Vulnerable (T-VN)	Considered to be facing a high risk of extinction in the wild
Threatened - Presumed extinct (T-EX)	Species which have been adequately searched for and there is no reasonable doubt that the last individual has died.
Conservation dependant (CD)	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened
Migratory birds protected under international agreement (IA)	Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds
Other specially protected fauna (OS)	Fauna otherwise in need of special protection to ensure their conservation

**Table A3. Flora or fauna that are potentially threatened but do not meet the survey criteria or are otherwise data deficient are listed under Priority categories by the DBCA.**

Category	Description
Priority One (P1)	Known from few locations (generally <5), small populations and/or occurring on land with insecure tenure
Priority Two (P2)	Known from few locations (generally <5), small populations with some occurring on land with secure tenure
Priority Three (P3)	Known from several locations with habitat not under imminent threat
Priority Four (P4)	(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy

**Table A4. Categories for ecological communities listed as Threatened (TEC). Communities can be recognised as Threatened under Federal (EPBC) and / or State (BC) Acts.**

Category	Description
Presumed totally destroyed (PU)	Adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.
Critically Endangered (CR)	Adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future.
Endangered (EN)	Adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future.
Vulnerable (VU)	Adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium (within approximately 50 years) to long-term future.



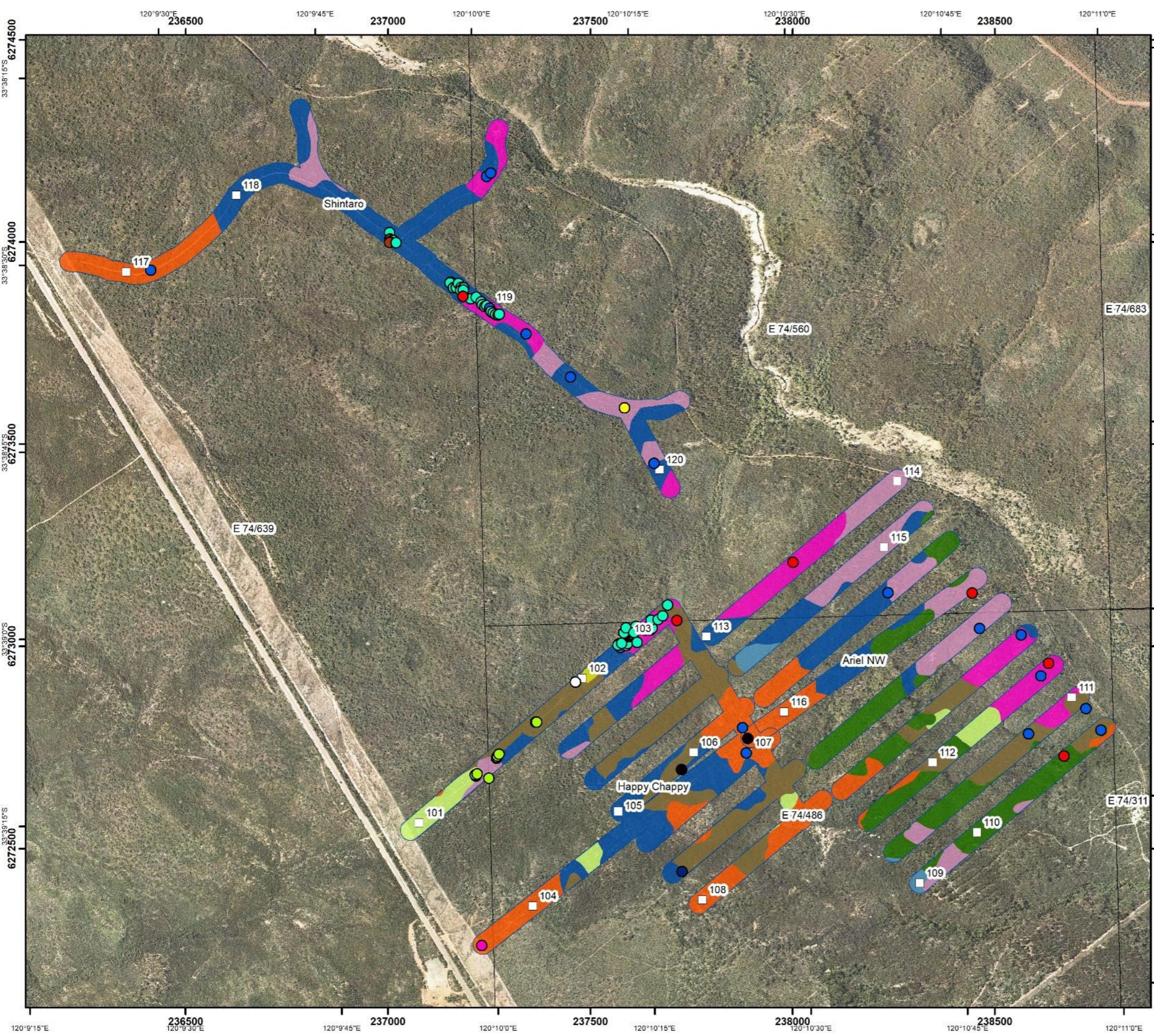
**Table A5. The categories for ecological communities listed as Priority (PEC) by the DBCA.**

<b>Category</b>	<b>Brief description</b>
Priority One (P1)	Known from very few occurrences with a very restricted distribution (generally $\leq 5$ occurrences or a total area of $\leq 100$ ha) and are currently under threat
Priority Two (P2)	Known from few occurrences with a restricted distribution (generally $\leq 10$ occurrences or a total area of $\leq 200$ ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years)
Priority Three (P3)	Known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: (ii) known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or; (iii) made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc
Priority Four (P4)	Adequately known, rare but not threatened or meet criteria for Near Threatened or that have been recently removed from the threatened list. These communities require regular monitoring
Priority Five (P5)	Conservation dependant ecological communities. Not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years

## **7 APPENDIX B - Maps**

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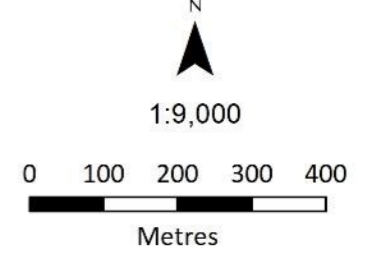
**Map 1: Vegetation Type, Conservation Significant Flora, Relve Locations, Wonderlust Exploration Areas.**

Map produced by Damien Rathbone on 25/10/2023.

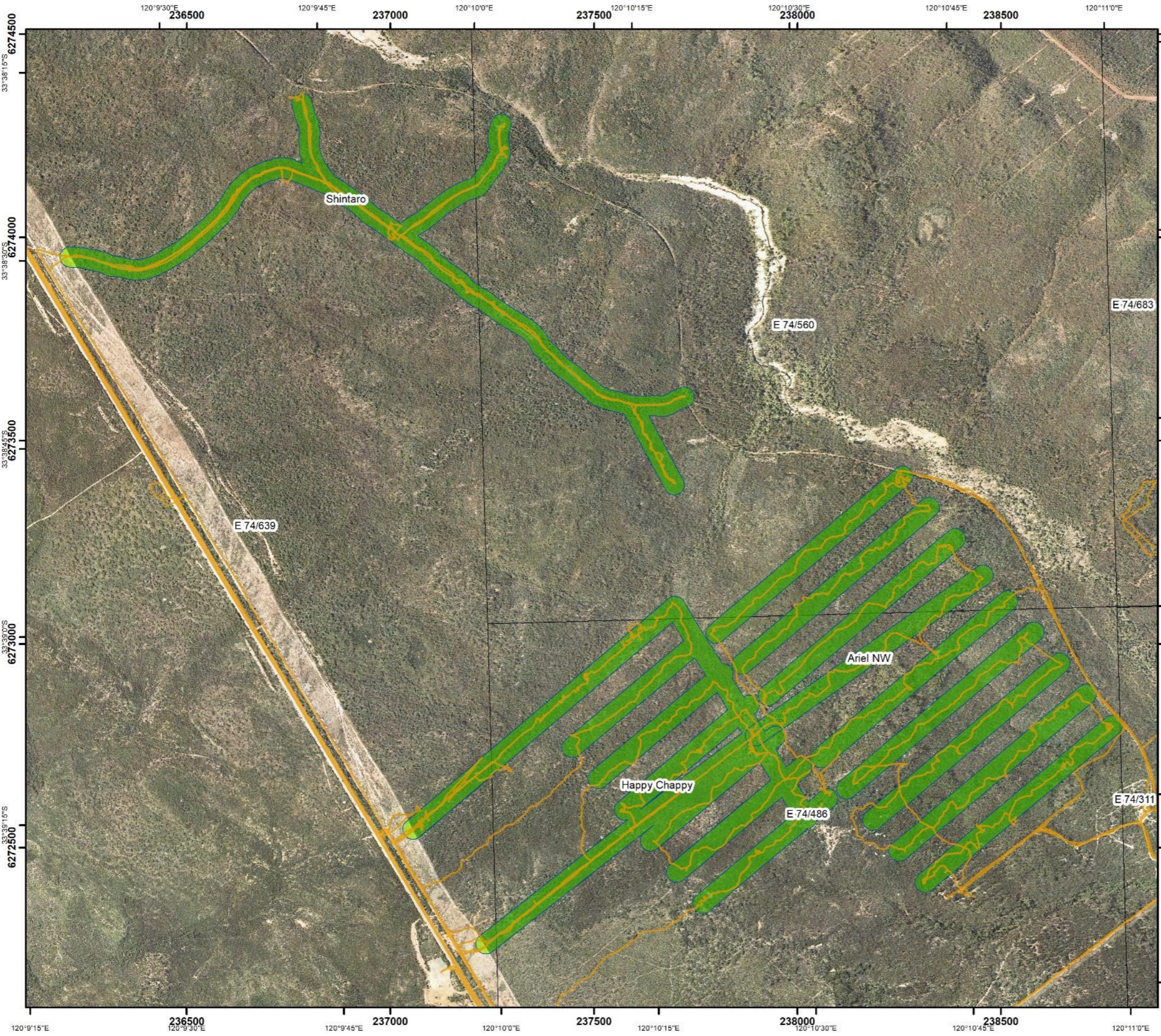
Map Projection: Transverse Mercator Horizontal Datum GDA 1994  
Grid: MGA Zone 51 Map Size: A3

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- Survey area
- Vegetation Type**
- Eple/Bmed (Kwongkan TEC)
  - Ecli
  - Edes/Alca
  - Eflo/Mcuc
  - Eflo/Muli
  - Epil
  - Epro/Mspp
  - Mallee/Mspp
  - Mell
- Conservation Significant Flora**
- *Lepidosperma* sp. Elverdton (R. Jasper et al. LCH 16844), P1
  - *Lepidosperma* sp. Mt Short (S. Kern et al. LCH 17510), P1
  - *Hydrocotyle tuberculata*, P2
  - *Pultanea brachyphylla*, P2
  - *Grevillea punctata*, P3
  - *Acacia errabunda*, P4
  - *Eucalyptus desmondensis*, P4
  - *Melaleuca penicula*, P4
  - *Andersonia* sp., OS
  - *Tricostularia* sp., OS
  - Relevé Locations (Number)







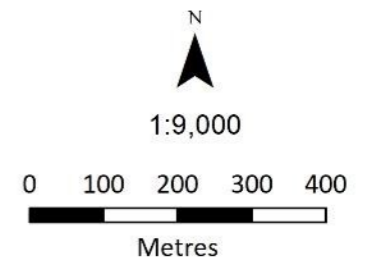
**Map 2: Vegetation Condition, Survey Effort. Wonderlust Exploration Areas.**

Map produced by Damien Rathbone on 25/10/2023.

Map Projection: Transverse Mercator Horizontal Datum GDA 1994  
 Grid: MGA Zone 51 Map Size: A3

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- Survey area
  - GPS Track Log
- Vegetation Condition**
- Excellent
  - Very Good





## 8 APPENDIX C - Plant Taxa Inventory

Table C1: Vascular plant taxa recorded in the survey area. Nomenclature and status according to WAH (1998-). \*denotes weed taxon. Note: Several species of *Lepidosperma* are not currently on the census, but are recognised as distinct in temporary sorting folders with names to be re-instated in the future (Barrett et al. 2009).

FAMILY	TAXON	STATUS
Amaranthaceae	<i>Ptilotus spathulatus</i>	
Apiaceae	<i>Daucus glochidiatus</i>	
Apocynaceae	<i>Alyxia buxifolia</i>	
Araliaceae	<i>Hydrocotyle callicarpa</i>	
Araliaceae	<i>Hydrocotyle rugosa</i>	
Araliaceae	<i>Hydrocotyle tuberculata</i>	2
Asparagaceae	<i>Lomandra micrantha</i> subsp. <i>teretifolia</i>	
Asparagaceae	<i>Thysanotus patersonii</i>	
Asteraceae	<i>Argentipallium niveum</i>	
Asteraceae	<i>Lagenophora huegelii</i>	
Asteraceae	<i>Olearia imbricata</i>	
Asteraceae	<i>Ozothamnus lepidophyllus</i>	
Boraginaceae	<i>Halgania anagaloides</i> var. <i>Southern</i> (A.E. Orchard 1609)	
Boraginaceae	<i>Halgania andromedifolia</i>	
Campanulaceae	<i>Isotoma hypocrateriformis</i>	
Casuarinaceae	<i>Allocasuarina campestris</i>	
Celastraceae	<i>Stackhousia monogyna</i>	
Cupressaceae	<i>Callitris drummondii</i>	
Cyperaceae	<i>Chorizandra enodis</i>	
Cyperaceae	<i>Eleocharis acuta</i>	
Cyperaceae	<i>Gahnia ancistrophylla</i>	
Cyperaceae	<i>Gahnia aristata</i>	
Cyperaceae	<i>Lepidosperma fimbriatum</i>	
Cyperaceae	<i>Lepidosperma gahnioides</i>	
Cyperaceae	<i>Lepidosperma sanguinolentum</i>	
Cyperaceae	<i>Lepidosperma</i> sp. Elverdton (R. Jasper et al. LCH 16844)	1
Cyperaceae	<i>Lepidosperma</i> sp. Mt Benson (R.L. Barrett & G.F. Craig RLB 3553)	
Cyperaceae	<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	1

FAMILY	TAXON	STATUS
Cyperaceae	<i>Lepidosperma</i> sp. Ravensthorpe (G.F. Craig 5188)	
Cyperaceae	<i>Lepidosperma tuberculatum</i>	
Cyperaceae	<i>Netrostylis</i> sp. Mt Madden (C.D. Turley 40 BP/897)	
Cyperaceae	<i>Schoenus acuminatus</i>	
Cyperaceae	<i>Schoenus odontocarpus</i>	
Cyperaceae	<i>Tricostularia</i> sp. (taxon not in WA census, previously called <i>T. aff. compressa</i> (Craig 2004)).	
Dilleniaceae	<i>Hibbertia acerosa</i>	
Dilleniaceae	<i>Hibbertia gracilipes</i>	
Droseraceae	<i>Drosera glanduligera</i>	
Ericaceae	<i>Acrotriche parvifolia</i>	
Ericaceae	<i>Andersonia parvifolia</i>	
Ericaceae	<i>Andersonia</i> sp. (taxon not in WA census, Cris Lemson intends to reinstate the name <i>A. bracyota</i> , Pers. Comm.)	
Ericaceae	<i>Leucopogon concinnus</i>	
Ericaceae	<i>Leucopogon fimbriatus</i>	
Ericaceae	<i>Leucopogon infuscatus</i>	
Ericaceae	<i>Leucopogon</i> sp. Coujinup (M.A. Burgman 1085)	
Fabaceae	<i>Acacia brachyclada</i>	
Fabaceae	<i>Acacia crassuloides</i>	
Fabaceae	<i>Acacia errabunda</i>	3
Fabaceae	<i>Acacia glaucoptera</i>	
Fabaceae	<i>Acacia gonophylla</i>	
Fabaceae	<i>Acacia ingrata</i>	
Fabaceae	<i>Acacia mimica</i>	
Fabaceae	<i>Acacia patagiata</i>	
Fabaceae	<i>Acacia pinguiculosa</i> subsp. <i>teretifolia</i>	
Fabaceae	<i>Acacia pravifolia</i>	
Fabaceae	<i>Acacia subcaerulea</i>	
Fabaceae	<i>Chorizema nervosum</i>	
Fabaceae	<i>Daviesia anceps</i>	
Fabaceae	<i>Daviesia benthamii</i>	
Fabaceae	<i>Daviesia nematophylla</i>	



FAMILY	TAXON	STATUS
Fabaceae	<i>Daviesia pachyloma</i>	
Fabaceae	<i>Daviesia pachyphylla</i>	
Fabaceae	<i>Daviesia teretifolia</i>	
Fabaceae	<i>Eutaxia cuneata</i>	
Fabaceae	<i>Gastrolobium musaceum</i>	
Fabaceae	<i>Gastrolobium tetragonophyllum</i>	
Fabaceae	<i>Gompholobium confertum</i>	
Fabaceae	<i>Pultenaea indira</i>	
Fabaceae	<i>Pultenaea purpurea</i>	
Fabaceae	<i>Senna artemisioides</i>	
Fabaceae	<i>Templetonia neglecta</i>	
Fabaceae	<i>Templetonia retusa</i>	
Fabaceae	<i>Templetonia sulcata</i>	
Geraniaceae	<i>Geranium solanderi</i>	
Goodeniaceae	<i>Coopermookia polygalacea</i>	
Goodeniaceae	<i>Coopermookia strophiolata</i>	
Goodeniaceae	<i>Dampiera angulata</i>	
Goodeniaceae	<i>Dampiera juncea</i>	
Goodeniaceae	<i>Dampiera lavandulacea</i>	
Goodeniaceae	<i>Goodenia concinna</i>	
Goodeniaceae	<i>Goodenia scapigera</i>	
Haemodoraceae	<i>Conostylis bealiana</i>	
Haloragaceae	<i>Glischrocaryon roei</i>	
Hemerocallidaceae	<i>Chamaescilla corymbosa</i>	
Hemerocallidaceae	<i>Dianella revoluta</i>	
Iridaceae	<i>Patersonia occidentalis</i>	
Lauraceae	<i>Cassytha melantha</i>	
Malvaceae	<i>Lasiopetalum indutum</i>	
Malvaceae	<i>Lasiopetalum rosmarinifolium</i>	
Malvaceae	<i>Thomasia foliosa</i>	
Montiaceae	<i>Calandrinia brevipedata</i>	
Myrtaceae	<i>Beaufortia micrantha</i>	

FAMILY	TAXON	STATUS
Myrtaceae	<i>Beaufortia orbifolia</i>	
Myrtaceae	<i>Beaufortia schaueri</i>	
Myrtaceae	<i>Calothamnus gracilis</i>	
Myrtaceae	<i>Calothamnus quadrifidus</i>	
Myrtaceae	<i>Calytrix leschenaultii</i>	
Myrtaceae	<i>Calytrix tetragona</i>	
Myrtaceae	<i>Chamelaucium ciliatum</i>	
Myrtaceae	<i>Ericomyrtus serpyllifolia</i>	
Myrtaceae	<i>Eucalyptus calycogona</i>	
Myrtaceae	<i>Eucalyptus cernua</i>	
Myrtaceae	<i>Eucalyptus clivicola</i>	
Myrtaceae	<i>Eucalyptus desmondensis</i>	4
Myrtaceae	<i>Eucalyptus flocktoniae</i>	
Myrtaceae	<i>Eucalyptus incrassata</i>	
Myrtaceae	<i>Eucalyptus leptocalyx</i>	
Myrtaceae	<i>Eucalyptus phaenophylla</i>	
Myrtaceae	<i>Eucalyptus phenax</i>	
Myrtaceae	<i>Eucalyptus pileata</i>	
Myrtaceae	<i>Eucalyptus platypus</i>	
Myrtaceae	<i>Eucalyptus pleurocarpa</i>	
Myrtaceae	<i>Eucalyptus proxima</i>	
Myrtaceae	<i>Eucalyptus sporadica</i>	
Myrtaceae	<i>Eucalyptus suggrandis</i>	
Myrtaceae	<i>Eucalyptus tetraptera</i>	
Myrtaceae	<i>Eucalyptus uncinata</i>	
Myrtaceae	<i>Kunzea affinis</i>	
Myrtaceae	<i>Kunzea cincinnata</i>	
Myrtaceae	<i>Kunzea jucunda</i>	
Myrtaceae	<i>Leptospermum erubescens</i>	
Myrtaceae	<i>Melaleuca acuminata</i>	
Myrtaceae	<i>Melaleuca bracteosa</i>	
Myrtaceae	<i>Melaleuca calycina</i>	

FAMILY	TAXON	STATUS
Myrtaceae	<i>Melaleuca cliffortioides</i>	
Myrtaceae	<i>Melaleuca cucullata</i>	
Myrtaceae	<i>Melaleuca elliptica</i>	
Myrtaceae	<i>Melaleuca glaberrima</i>	
Myrtaceae	<i>Melaleuca hamata</i>	
Myrtaceae	<i>Melaleuca haplantha</i>	
Myrtaceae	<i>Melaleuca lateriflora</i>	
Myrtaceae	<i>Melaleuca marginata</i>	
Myrtaceae	<i>Melaleuca pauperiflora</i>	
Myrtaceae	<i>Melaleuca rigidifolia</i>	
Myrtaceae	<i>Melaleuca stramentosa</i>	
Myrtaceae	<i>Melaleuca subfalcata</i>	
Myrtaceae	<i>Taxandria spathulata</i>	
Myrtaceae	<i>Tetrapora verrucosa</i>	
Myrtaceae	<i>Verticordia acerosa</i> var. <i>preissii</i>	
Myrtaceae	<i>Verticordia chrysantha</i>	
Orchidaceae	<i>Caladenia attingens</i>	
Orchidaceae	<i>Cyanicula aperta</i>	
Orchidaceae	<i>Eriochilus dilatatus</i>	
Orchidaceae	<i>Pterostylis vittata</i>	
Orchidaceae	<i>Pyrorchis nigricans</i>	
Oxalidaceae	<i>Oxalis exilis</i>	
Phyllanthaceae	<i>Phyllanthus calycinus</i>	
Phyllanthaceae	<i>Poranthera microphylla</i>	
Pittosporaceae	<i>Marianthus bicolor</i>	
Pittosporaceae	<i>Marianthus microphyllus</i>	
Poaceae	<i>Amphipogon turbinatus</i>	
Poaceae	<i>Neurachne alopecuroidea</i>	
Poaceae	<i>Spartochloa scirpoidea</i>	
Polygalaceae	<i>Comesperma spinosum</i>	
Polygalaceae	<i>Comesperma volubile</i>	
Primulaceae	<sup>^</sup> <i>Lysimachia arvensis</i>	

FAMILY	TAXON	STATUS
Proteaceae	<i>Banksia cirsioides</i>	
Proteaceae	<i>Banksia lemanniana</i>	
Proteaceae	<i>Banksia media</i>	
Proteaceae	<i>Banksia tenuis</i>	
Proteaceae	<i>Grevillea anethifolia</i>	
Proteaceae	<i>Grevillea oligantha</i>	
Proteaceae	<i>Grevillea patentiloba</i> subsp. <i>patentiloba</i>	
Proteaceae	<i>Grevillea pectinata</i>	
Proteaceae	<i>Grevillea punctata</i>	3
Proteaceae	<i>Hakea commutata</i>	
Proteaceae	<i>Hakea lasiantha</i>	
Proteaceae	<i>Hakea laurina</i>	
Proteaceae	<i>Hakea lissocarpa</i>	
Proteaceae	<i>Hakea marginata</i>	
Proteaceae	<i>Hakea verrucosa</i>	
Proteaceae	<i>Isopogon</i> sp. Fitzgerald River (D.B. Foreman 813)	
Proteaceae	<i>Persoonia teretifolia</i>	
Proteaceae	<i>Petrophile fastigiata</i>	
Proteaceae	<i>Petrophile squamata</i>	
Restionaceae	<i>Desmocladius lateriflorus</i>	
Rhamnaceae	<i>Spyridium cordatum</i>	
Rhamnaceae	<i>Trymalium elachophyllum</i>	
Rutaceae	<i>Boronia inconspicua</i>	
Rutaceae	<i>Boronia inomata</i>	
Rutaceae	<i>Boronia octandra</i>	
Rutaceae	<i>Boronia oxyantha</i> var. <i>brevicalyx</i>	
Rutaceae	<i>Boronia scabra</i>	
Rutaceae	<i>Boronia tetrandra</i>	
Rutaceae	<i>Rhadinothamnus rudis</i> subsp. <i>amblycarpus</i>	
Santalaceae	<i>Exocarpos aphyllus</i>	
Santalaceae	<i>Leptomeria pauciflora</i>	
Santalaceae	<i>Santalum lanceolatum</i>	



FAMILY	TAXON	STATUS
Sapindaceae	<i>Dodonaea concinna</i>	
Sapindaceae	<i>Dodonaea pinifolia</i>	
Sapindaceae	<i>Dodonaea ptarmicaefolia</i>	
Sapindaceae	<i>Dodonaea trifida</i>	
Sapindaceae	<i>Dodonaea viscosa</i>	
Stylidiaceae	<i>Stylidium breviscapum</i>	
Stylidiaceae	<i>Stylidium caespitosum</i>	
Stylidiaceae	<i>Stylidium diversifolium</i>	
Stylidiaceae	<i>Stylidium spinulosum</i>	

## 9 APPENDIX D - Likelihood of Occurrence Analysis

A likelihood of occurrence (post-survey) of all conservation significant species was assessed based on the presence of suitable habitat and other factors as outlined in Table E1. Suitable habitat was determined from information in herbarium voucher labels, published descriptions, distribution records and knowledge from the authors.

Table D1. Post-survey likelihood of occurrence of conservation significant flora recorded in the vicinity of the survey area (<10 km). \*Source of records include Protected Matters Search Tool (PMST), Department of Biodiversity, Conservation and Attractions (DBCA) and Naturemap (NM).

Status, Taxon [FAMILY]	Source*	Description, Habitat & Distribution	Likelihood of Occurrence
T <i>Acacia rhamphophylla</i> [Fabaceae]	NM, PMST, DBCA	Low spreading shrub, 0.2-0.4 m high. Fl. yellow, Aug to Sep. Rocky or sandy clay. Upper slopes of low ranges.	Unlikely. Known from highly restricted distribution in southern part of Ravensthorpe Range.
T <i>Anigozanthos bicolor</i> subsp. <i>minor</i>	PMST	Rhizomatous, perennial, herb, 0.05-0.2 m high. Fl. green red, Aug to Oct. Sand. Well-watered sites.	Unlikely. No suitable habitat present.
T <i>Conostylis lepidospermoides</i> [Haemodoraceae]	DBCA	Rhizomatous, tufted perennial, grass-like or herb, 0.17-0.36 m high. Fl. yellow, Sep to Oct. Grey or yellow-brown sand over laterite.	Unlikely. No suitable habitat present.
T <i>Darwinia oxylepis</i> [Myrtaceae]	PMST	Stirling Range endemic.	Unlikely. Geospatial error.
T <i>Darwinia wittwerorum</i> [Myrtaceae]	PMST	Stirling Range endemic.	Unlikely. Geospatial error.
T <i>Daviesia megacalyx</i> [Fabaceae]	PMST, NM, DBCA	Erect shrub, 0.7-1.6 m high. Fl. yellow/orange & red/brown/pink, Aug to Sep. Gravelly laterite. Ridges, hillslopes.	Unlikely. No suitable habitat present.
T <i>Eremophila denticulata</i> subsp. <i>denticulata</i> [Scrophulariaceae]	PMST	Erect, open shrub, 0.5-2.5 m high. Fl. pink-orange/yellow-orange-red, Aug to Dec or Jan to Feb. Alluvium, sand, sandy clay loam. River beds & plains, laterite breakaways.	Unlikely. No recorded in the Steere River.
T <i>Eremophila subterretifolia</i> [Scrophulariaceae]	PMST	Prostrate shrub, 0.04-0.15 m high, to 2.5 m wide. Fl. orange, Nov to Dec. Grey sand, loam. Edges of salt lakes, sub-saline flats.	Unlikely. No suitable habitat present.
T <i>Eucalyptus purpurata</i> [Myrtaceae]	NM, DBCA	Tree or (mallet), to 10 m high, bark smooth throughout, decortivating in short, long strips, dull light grey over cream. Fl. cream, Nov. White powdery loam, magnesite. Eastern and north-eastern slopes of ridges.	Unlikely. Known from highly restricted distribution at Bandalup Hill.
T <i>Eucalyptus steedmanii</i> [Myrtaceae]	NM	Tree, 2-8(-12) m high, bark smooth. Fl. white, Jan to Mar. Gravelly loam over ironstone, sand. Low hills, undulating plains.	Unlikely. No suitable habitat present.
T <i>Ricinocarpus trichophorus</i> [Euphorbiaceae]	PMST	Erect, openly branching shrub, 0.3-1 m high. Fl. white, May or Aug to Sep. Sandy clay, loam. Breakaways, among sandstone rocks.	Unlikely. No suitable habitat present.
T <i>Roycea pycnophylloides</i> [Chenopodiaceae]	PMST	Perennial, herb, forming densely branched, silvery mats to 1 m wide. Fl. Sep. Sandy soils, clay. Saline flats.	Unlikely. No suitable habitat present.
T <i>Thelymitra psammophila</i> [Orchidaceae]	PMST	Tuberous, perennial, herb, 0.15-0.25 m high. Fl. yellow, Sep to Oct. Sandy clay, loam.	Unlikely. No suitable habitat present.
P1 <i>Acacia besleyi</i> [Fabaceae]	NM, DBCA	Domed shrub up to 1.7m high and wide. Eucalyptus woodland often associated with water courses. Yellow flowers; Aug-Sept.	Unlikely. Suitable habitat present was surveyed, unlikely to be overlooked.
P1 <i>Acacia</i> sp. Ravensthorpe Range (B.R. Maslin 5463) [Fabaceae]	NM, DBCA	Low spreading shrub, 0.2-0.3 m high. Fl. yellow, Aug to Oct. Rocky clay, clayey loam.	Unlikely. Soil and landform characteristics in the survey area may be suitable. No survey limitations present and unlikely to be overlooked.
P1 <i>Austrostipa</i> sp. Carlingup Road (S. Kern &	NM, DBCA	Tussocking grass to 40cm. Eucalypt woodland on brown clay sandy loam.	Possible. Soil and landform characteristics in the survey area may be suitable.

Status, Taxon [FAMILY]	Source*	Description, Habitat & Distribution	Likelihood of Occurrence
R. Jasper LCH 18459) [Poaceae]			Relatively indistinct and may difficult to detect.
P1 <i>Austrostipa</i> sp. Ravensthorpe Range (A. Markey & J. Allen 6261) [Poaceae]	NM, DBCA	Grass to 50cm. Eucalypt woodland on brown clay sandy loam.	Possible. Soil and landform characteristics in the survey area may be suitable. Relatively indistinct and may difficult to detect.
P1 <i>Calothamnus roseus</i> [Myrtaceae]	NM, DBCA	Shrub to 2m. Red to pink flowers Sep-Dec. Undulating hills, ridges with sandy clay grey to brown. White quartzite.	Unlikely. No suitable habitat present.
P1 <i>Cryptandra craigiae</i> [Rhamnaceae]	NM, DBCA	Erect to spreading shrub, 0.1-0.25 m high. Sand. Low-lying sand dunes, low rises between or adjacent to swampy areas, gutter on disturbed road verge.	Unlikely. No suitable habitat present.
P1 <i>Grevillea sulcata</i> [Proteaceae]	NM, DBCA	Shrub to 1m. Red flowers Apr-Jun. Red brown clay.	Unlikely. Soil and landform characteristics in the survey area may be suitable. No survey limitations present and unlikely to be overlooked.
P1 <i>Guichenotia anota</i> [Malvaceae]	NM	Shrub, 0.3-1 m high. Fl. pink-purple, Nov to Dec. Sandy, loamy gravel. Undulating land.	Unlikely. Known from high restricted distribution in other parts of Ravensthorpe Range.
P1 <i>Guichenotia apetala</i> [Malvaceae]	NM, DBCA	Compact, much-branched shrub, 0.15-0.4 m high. Fl. blue-pink/pink, May or Sep to Dec. Gravel, laterite.	Unlikely. Known from high restricted distribution in other parts of Ravensthorpe Range.
P1 <i>Hibbertia atrichosepala</i> [Dilleniaceae]	NM, DBCA	Erect shrub to 1.5m. Yellow flowers in May, Nov-Dec. Dense mallee shrub. Undulating land. Red brown clay.	Unlikely. Known from high restricted distribution in northern part of Ravensthorpe Range.
P1 <i>Lepidosperma</i> sp. Elverdton (R. Jasper et al. LCH 16844) [Cyperaceae]	NM, DBCA	Sedge to 50cm. Tall open mallee/shrubland. Red brown clay loam with quartzite fragments on surface.	Present.
P1 <i>Lepidosperma</i> sp. Hopetoun Road (S. Kern et al. LCH 16552) [Cyperaceae]	NM, DBCA	Sedge to 40cm. Tall open mallee/shrubland. Pinkish-grey to red brown clay loam.	Possible. Soil and landform characteristics in the survey area may be suitable. Could be difficult to detect in low numbers.
P1 <i>Lepidosperma</i> sp. Maydon (S. Kern [Cyperaceae]	NM, DBCA	Sedge to 40cm, Tall open sparse mallee. Redish brown clay, ironstone fragments on surface.	Possible. Soil and landform characteristics in the survey area may be suitable. Could be difficult to detect in low numbers. No comparative specimen available in Ravensthorpe Herbarium.
P1 <i>Lepidosperma</i> sp. Mt Chester (S. Kern et al. LCH 16596) [Cyperaceae]	NM, DBCA	Sedge to 30cm. Low open mallees woodland. Grey brown sandy clay loam. Sandstone fragments on surface.	Possible. Soil and landform characteristics in the survey area may be suitable. Could be difficult to detect in low numbers.
P1 <i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510) [Cyperaceae]	NM, DBCA	Sedge to 80cm. Low open mallee woodland. Brown sandy clay loam. Out cropping of greenstone.	Present.
P1 <i>Lepidosperma</i> sp. Steere River (S. Kern [Cyperaceae]	NM	Sedge to 60cm. Open mallee over shrubs. Grey to cream sandy loam.	Possible. Soil and landform characteristics in the survey area may be suitable. Could be difficult to detect in low numbers.
P1 <i>Melaleuca sophisma</i> [Myrtaceae]	NM, DBCA	Shrub to 2m, white flowers Oct-Nov. Open mallee over dense shrub heath. Brown sandy clay loams,	Unlikely. Known from high restricted distribution in Ravensthorpe Area.
P2 <i>Acacia papulosa</i> [Fabaceae]	DBCA	Bushy shrub, 0.25-2 m high. Fl. Aug to Sep. Spongolitic loam.	Unlikely. No suitable habitat present.
P2 <i>Anticoryne ovalifolia</i> [Myrtaceae]	NM, DBCA	Erect shrub to 1m, white flowers Sep-Dec. Mid-dense shrub heathland on white sands.	Unlikely. No suitable habitat present.
P2 <i>Cassinia arcuata</i> [Asteraceae]	NM, DBCA	Aromatic shrub, to 2 m high. Fl. brown, mainly Jan to Apr.	Unlikely. Suitable habitat present was surveyed, unlikely to be overlooked.

Status, Taxon [FAMILY]	Source*	Description, Habitat & Distribution	Likelihood of Occurrence
P2 <i>Hakea acuminata</i> [Proteaceae]	DBCA	Shrub, 0.5-1.8 m high. Deep white sand, grey sand over granite, loam. Undulating plain.	Unlikely. No suitable habitat present.
P2 <i>Hydrocotyle tuberculata</i> [Araliaceae]	NM, DBCA	Small annual herb. Red fruits. Sandy loams adjacent to salt lakes and creeklines.	Present.
P2 <i>Lasiopetalum</i> sp. Desmond (N. McQuoid 653) [Malvaceae]	NM, DBCA	Small shrub to 60 cm. Pink flowers Aug-Nov. Myrtaceous heath over white-grey sand.	Unlikely. Soil and landform characteristics in the survey area may be suitable. No survey limitations present and unlikely to be overlooked.
P2 <i>Pultenaea brachyphylla</i> [Fabaceae]	NM, DBCA	Low shrub to 60 cm with orange flowers Aug-Oct.	Present.
P2 <i>Thomasia</i> sp. Hopetoun (K.R. Newbey 4896) [Malvaceae]	NM, DBCA	Erect shrub to 1.2 m. White to mauve flowers Aug-Sep. Open mallee over grey brown sandy clay loam.	Unlikely. Soil and landform characteristics in the survey area may be suitable. No survey limitations present and unlikely to be overlooked. present.
P3 <i>Acacia bifaria</i> [Fabaceae]	NM, DBCA	Prostrate or semi-prostrate, commonly domed shrub, 0.3-0.6(-0.8) m high, to 2 m wide. Fl. yellow, Aug to Oct or Dec. Clay, rocky loam, sandy soils. Undulating plains, roadsides, low-lying areas.	Unlikely. Soil and landform characteristics in the survey area may be suitable. No survey limitations present and unlikely to be overlooked.
P3 <i>Acacia errabunda</i> [Fabaceae]	NM, DBCA	Dense, bushy, spreading shrub, 1-2.5 m high. Fl. yellow. Clay, loam, gravelly loam, sand. Undulating plains, clay flats.	Present.
P3 <i>Acacia improcera</i> [Fabaceae]	NM, DBCA	Spreading, spiny shrub, 0.15-0.4 m high. Fl. yellow, Aug. Sand, loamy clay, clay. Undulating plains, flats.	Unlikely. Soil and landform characteristics in the survey area may be suitable. No survey limitations present and unlikely to be overlooked.
P3 <i>Banksia corviflora</i> [Proteaceae]	NM, DBCA	Dense, rounded, ?non-lignotuberous shrub, 0.4-1.3 m high. Fl. yellow/orange & red/brown, Sep to Oct. Gravelly lateritic soils. Hillslopes.	Unlikely. No suitable habitat present.
P3 <i>Banksia rufa</i> subsp. <i>chelomacarpa</i> [Proteaceae]	NM	Prostrate shrub, to 0.45 m high. Fl. yellow, Jul to Oct. Sandy loam over gravel.	Unlikely. No suitable habitat present, outside species range.
P3 <i>Dampiera</i> sp. Ravensthorpe (G.F. Craig 8277) [Goodeniaceae]	NM, DBCA	Erect clumping herb to 0.6 m with terete leaves and purple flowers Sep-Nov. Low eucalypt woodland over shrubs. Brown grey sandy loam. Low hills, rocky outcrops.	Unlikely. Soil and landform characteristics in the survey area may be suitable. No survey limitations present and unlikely to be overlooked.
P3 <i>Daviesia newbeyi</i> [Fabaceae]	NM, DBCA	Bushy, multi-stemmed, broom-like shrub, 0.25-1.5 m high. Fl. orange/yellow & red, Aug to Oct. Sand or sandy clay over granite. Rocky slopes.	Unlikely. Soil and landform characteristics in the survey area may be suitable. No survey limitations present and unlikely to be overlooked.
P3 <i>Eucalyptus famelica</i> [Myrtaceae]	NM, DBCA	Mallee 1.5-4 m high, bark smooth. Fl. white, Apr to Jul. White/grey sand. Wet areas, sometimes slightly brackish.	Unlikely. No suitable habitat present.
P3 <i>Grevillea fulgens</i> [Proteaceae]	NM, DBCA	Spreading to straggling, non-lignotuberous shrub, 0.5-2 m high. Fl. red/pink-red, May to Oct or Dec. Gravel over laterite. Hillsides.	Unlikely. Soil and landform characteristics in the survey area may be suitable. No survey limitations present and unlikely to be overlooked.
P3 <i>Grevillea punctata</i> [Proteaceae]	NM, DBCA	Shrub, 0.5-2 m high. Fl. red, Apr to May or Nov. Stony red loam, red clay.	Present.
P3 <i>Hopkinsia adscendens</i> [Anarthriaceae]	NM	Rhizomatous, perennial, herb, to 0.4 m high. Fl. Oct. Sand. Dry or seasonally damp habitats along streams	Unlikely. No suitable habitat present.
P3 <i>Lepidosperma</i> sp. Shoemaker Levy (L. Ang & O. Davies 10815) [Cyperaceae]	NM, DBCA	Sedge to 50 cm. Open eucalypt woodland over shrubs. Yellow brown sandy loam soils with quartz and ironstone fragments	Possible. Soil and landform characteristics in the survey area may be suitable. Could be difficult to detect in low numbers.
P3 <i>Melaleuca coccinea</i> [Myrtaceae]	NM, DBCA	Much branched shrub, 1.5-2.6 m high, leaf blade elliptic to ovate, 1.5-2.2 times as long as wide. Fl. red, Sep to Nov or Jan.	Unlikely. No suitable habitat present.



Status, Taxon [FAMILY]	Source*	Description, Habitat & Distribution	Likelihood of Occurrence
		Sandy loam over granite. Granite outcrops, sandplain, river valleys.	
P3 <i>Micromyrtus navicularis</i> [Myrtaceae]	NM, DBCA	Spindly, erect shrub, to 1.6 m high. Sand with gravel, laterite, granite. Hill slopes.	Unlikely. Soil and landform characteristics in the survey area may be suitable. No survey limitations present and unlikely to be overlooked.
P3 <i>Pultenaea craigiana</i> [Fabaceae]	NM, DBCA	Low shrub to 60 cm with orange flowers Aug-Oct. Low eucalypt woodland over shrubs. Brown grey clay loam.	Unlikely. Soil and landform characteristics in the survey area may be suitable. No survey limitations present and unlikely to be overlooked.
P3 <i>Sphaerobium validum</i> [Fabaceae]	NM	Erect shrub, to 0.9 m high. Fl. yellow & red, Sep. White-grey sand, red-brown clayey sand, laterite gravel and quartz pebbles. Gently undulating areas, flats, roadsides.	Unlikely. Soil and landform characteristics in the survey area may be suitable. No survey limitations present and unlikely to be overlooked.
P3 <i>Synaphea drummondii</i> [Proteaceae]	DBCA	Shrub. Fl. yellow, Jul to Sep. Sand over laterite.	Unlikely. No suitable habitat present.
P3 <i>Verticordia gracilis</i> [Myrtaceae]	NM	Low, slender shrub, 0.15-0.6 m high. Fl. pink, Oct to Nov. Yellow sand, gravelly sand, sandy loam.	Unlikely. No suitable habitat present.
P4 <i>Acacia argutifolia</i> [Fabaceae]	NM, DBCA	Low spreading, intricate shrub, 0.2-0.7 m high. Fl. yellow/cream, Jul to Dec or Jan. Shallow sand over quartzite. Rocky hills & ridges.	Unlikely. No suitable habitat present.
P4 <i>Acacia grisea</i> [Fabaceae]	NM, DBCA	Spreading or compact shrub, 0.1-0.6 m high. Fl. yellow, Jun to Aug. Lateritic gravelly loamy soils. Undulating plains, slopes.	Unlikely. No suitable habitat present.
P4 <i>Allocasuarina hystricosa</i> [Casuarinaceae]	NM, DBCA	Dioecious shrub, to 3 m high, with erect branchlets with 10-12 leaf teeth per whorl. Orange, red or brown loam with limestone or granite outcropping. Plains, lower slopes, hilltops.	Unlikely. Soil and landform characteristics in the survey area may be suitable. No survey limitations present and unlikely to be overlooked.
P4 <i>Banksia foliosissima</i> [Proteaceae]	NM, DBCA	Dense, erect, non-lignotuberosus shrub, 1-2(-3) m high. Fl. yellow, May or Aug. Gravelly sand or sandy clay over laterite. Hill top & upper slopes.	Unlikely. No suitable habitat present.
P4 <i>Banksia laevigata</i> subsp. <i>laevigata</i> [Proteaceae]	NM, DBCA	Non-lignotuberosus shrub, 1-3.5 m high. Fl. green-yellow, Sep to Dec. Rocky soils (spongolite, laterite). Hills, top of breakaways.	Unlikely. No suitable habitat present.
P4 <i>Beyeria villosa</i> [Euphorbiaceae]	NM, DBCA	Shrub to 1.5 m flowering in May. Low undulating hills. Brown grey loam.	Unlikely. No suitable habitat present.
P4 <i>Dampiera deltoidea</i> [Goodeniaceae]	NM, DBCA	Erect perennial, herb, 0.12-0.4 m high. Fl. blue, Sep to Nov. Sand, sandy clay, loam. Sandplains, around quartzite rocks.	Unlikely. No suitable habitat present.
P4 <i>Eucalyptus desmondensis</i> (Desmond Mallee) [Myrtaceae]	NM, DBCA	Mallee, slender, willowy. 1-4.5 m high, bark smooth. Fl. yellow, Jan to Jun or Aug to Dec. Stony loam or sand, clay, granitic soils. Rocky hillsides, sandplains.	Present.
P4 <i>Eucalyptus stoatei</i> (Scarlet Pear Gum) [Myrtaceae]	NM, DBCA	Slender tree, 2-7.5 m high, bark smooth. Fl. yellow, Jul to Aug or Oct to Dec or Jan to Feb. Gravelly sand or clay, sandy loam. Flats, rises.	Unlikely. No suitable habitat present.
P4 <i>Eucalyptus x bennettiae</i> [Myrtaceae]	NM, DBCA	Mallee, 2.5 m high, bark smooth. Red quartzite rubble, red loam. Slopes.	Unlikely. No suitable habitat present.
P4 <i>Goodenia phillipsiae</i> [Goodeniaceae]	NM, DBCA	Shrub, ca 0.3 m high. Fl. yellow, Nov.	Possible. Soil and landform characteristics in the survey area may be suitable. Could be difficult to detect in low numbers.
P4 <i>Goodenia stenophylla</i> [Goodeniaceae]	NM, DBCA	Erect shrub, 0.3-2 m high. Fl. white, Sep to Dec or Jan. Rocky soils. Granite or quartzite rocks, steep slopes.	Unlikely. No suitable habitat present.
P4 <i>Grevillea fastigiata</i> [Proteaceae]	NM, DBCA	Shrub, 0.9-1.3 m high. Fl. red, Jan. Red clay, granite.	Unlikely. No suitable habitat present.

Status, Taxon [FAMILY]	Source*	Description, Habitat & Distribution	Likelihood of Occurrence
P4 <i>Grevillea prostrata</i> [Proteaceae]	NM, DBCA	Loose, prostrate shrub, 0.04-0.1 m high, 0.8-1.2 m wide. Fl. cream-white/pink-red, Aug to Dec or Jan. White, grey or yellow sand, gravel. Sandplains.	Unlikely. No suitable habitat present.
P4 <i>Leucopogon compactus</i> [Ericaceae]	NM	Much-branched shrub, 0.3-1 m high. Fl. white, Jun to Aug or Dec. Yellow sand with lateritic gravel, stony clay, loam over granite. Plains, hillslopes.	Unlikely. No suitable habitat present.
P4 <i>Marianthus mollis</i> [Pittosporaceae]	NM, DBCA	Low branching, spreading, silky hairy shrub, to 0.5 m high. Fl. blue, Aug to Sep. Laterite soils. Hills and ridges. Abundant in recently burnt areas.	Unlikely. Soil and landform characteristics in the survey area may be suitable. No survey limitations present and unlikely to be overlooked.
P4 <i>Melaleuca penicula</i> [Myrtaceae]	NM, DBCA	Spreading shrub, 1.8-3 m high, leaf blade narrowly ovate, 2.7-3.8 times as long as wide. Fl. red, Jan to Feb. Red/brown loamy sand or red sandy clay. Granite outcrops, valley slopes.	Present.
P4 <i>Pultenaea calycina</i> subsp. <i>proxena</i> [Fabaceae]	NM, DBCA	Many-branched, compact shrub. Sand, clay, sandy clay or loam, with gravel, over magnesite. Moderate slopes, adjacent to creek beds.	Unlikely. Soil and landform characteristics in the survey area may be suitable. No survey limitations present and unlikely to be overlooked.
P4 <i>Stachystemon vinosus</i> [Euphorbiaceae]	DBCA	Compact shrub, to 0.1 m high. Fl. purple-red/white, Sep to Nov. Fine loamy sand, stony soils. Sandplains, rock crevices on breakaways.	Unlikely. Soil and landform characteristics in the survey area may be suitable. No survey limitations present and unlikely to be overlooked.
P4 <i>Thysanotus parviflorus</i> [Asparagaceae]	NM, DBCA	Perennial, herb, 0.1-0.3 m high. Fl. purple, Oct to Nov. Grey sand.	Unlikely. No suitable habitat present.
P4 <i>Verticordia integra</i> [Myrtaceae]	NM	Spindly shrub, 0.5-1 m high. Fl. yellow, Oct to Dec. Sandy soils over laterite.	Unlikely. No suitable habitat present.

## 10 APPENDIX E - Floristic Data

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### Summary

Total number of species = 192

Number of families = 41

Number of weed species = 1

Number of conservation significant flora species = 7

Number of species in families = Myrtaceae (49), Fabaceae (28), Proteaceae (19), Cyperaceae (14), Rutaceae (7), Goodeniaceae (7), Ericaceae (6), Sapindaceae (5).

Number of quadrats = 0

Number of relevés = 20

Average richness overall =  $20.6 \pm 1.8$  (S.E.)

<b>Vegetation Type</b>	<b># sp.</b>	<b># sites</b>	<b>Av. # species</b>
Ecli	15	1	15
Edes/Alca	23	2	13
Eflo/Mcuc	19	2	11
Eflo/Mgor	71	1	28
Epil	14	1	14
Eple/Bmed	78	5	25.2
Epro/Mspp	70	3	28
Mallee/Mspp	59	4	19
Mell	22	1	22

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<i>Cooperhooikia polygalacea</i>	m
<i>Cooperhooikia strophiolata</i>	m
<i>Daviesia benthamii</i>	m
<i>Daviesia nematophylla</i>	m
<i>Hakea commutata</i>	m
<i>Hakea laurina</i>	m
<i>Halgania andromedifolia</i>	m
<i>Melaleuca cucullata</i>	m
<i>Melaleuca hamata</i>	m
<i>Melaleuca lateriflora</i>	m
<i>Melaleuca marginata</i>	m
<i>Melaleuca subfalcata</i>	m
<i>Pultenaea purpurea</i>	m
<i>Gahnia aristata</i>	g
<i>Lepidosperma gahnioides</i>	g
<i>Lepidosperma tuberculatum</i>	g
<i>Neurachne alopecuroidea</i>	g
<i>Thysanotus patersonii</i>	g

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**Species outside quadrat/relevé:** *Eucalyptus phenax*, *Acrotriche cordata*, *Alyxia buxifolia*, *Beaufortia orbifolia*, *Boronia scabra*, *Chamelaucium ciliatum*, *Comesperma spinosum*, *Dampiera juncea*, *Dampiera lavandulacea*, *Daviesia anceps*, *Dodonaea concinna*, *Dodonaea pinifolia*, *Eutaxia cuneata*, *Exocarpos aphyllus*, *Gastrolobium musaceum*, *Gastrolobium tetragonophyllum*, *Gompholobium confertum*, *Grevillea oligantha*, *Grevillea pectinata*, *Grevillea punctata*, *Hakea verrucosa*, *Hibbertia acerosa*, *Leptomeria pauciflora*, *Leucopogon* sp. Coujinup (M.A. Burgman 1085), *Melaleuca glaberrima*, *Petrophile fastigiata*, *Senna artemisioides*, *Templetonia neglecta*, *Tetrapora verrucosa*, *Chamaescilla corymbosa*, *Chorizandra enodis*, *Cyanicula aperta*, *Dianella revoluta*, *Eriochilus dilatatus*, *Gahnia aristata*, *Geranium solanderi*, *Hydrocotyle tuberculata*, *Lagenophora huegelii*, *Lepidosperma fimbriatum*, *Oxalis exilis*, *Phyllanthus calycinus*, *Poranthera microphylla*, *Stackhousia monogyna*, *Daucus glochidiatus*



<b>Relevé:</b>	102	<b>Latitude:</b>	237480	<b>Vegetation Structure:</b>	
<b>Date:</b>	8/9/2021	<b>Longitude:</b>	6272921	<b>-Upper (u):</b>	4m, 10-30%
<b>Soil Colour:</b>	orange	<b>Condition:</b>	Excellent	<b>-Middle (m):</b>	1.5m, 30-70%
<b>Soil Type:</b>	clay	<b>Fire Age:</b>	long unburnt	<b>-Ground (g):</b>	0.5m, 10-30%
<b>Rock Type:</b>	quartz and granitic				
<b>Vegetation Type:</b>	<i>Mell</i>				

**Site Comments:**

Taxon	Layer	Dominant	Cover	Status	Comments
<i>Eucalyptus pleurocarpa</i>	u				
<i>Eucalyptus sporadica</i>	u				
<i>Acacia crassuloides</i>	m				
<i>Acacia patagiata</i>	m				
<i>Calytrix leschenaultii</i>	m				
<i>Chamelaucium ciliatum</i>	m				
<i>Comesperma volubile</i>	m				
<i>Daviesia pachyphylla</i>	m				
<i>Euryomyrtus serpyllifolia</i>	m				
<i>Grevillea punctata</i>	m				

<i>Leucopogon concinnus</i>	m	
<i>Melaleuca elliptica</i>	m	
<i>Melaleuca hamata</i>	m	
<i>Melaleuca rigidifolia</i>	m	
<i>Petrophile fastigiata</i>	m	
<i>Drosera glanduligera</i>	g	
<i>Isotoma hypocrateriformis</i>	g	
<i>Lepidosperma</i> sp. Mt Short (S. Kem et al. LCH 17510)	g	1
<i>Lepidosperma</i> sp. Ravensthorpe (G.F. Craig 5188)	g	
<i>Tricostularia</i> sp.	g	
<i>Spartochloa scirpoidea</i>	g	
<i>Stylidium diversifolium</i>	g	

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<i>Melaleuca rigidifolia</i>	m	
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	g	1
<i>Stylidium breviscapum</i>	g	

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**Species outside quadrat/relevé:** *Acacia pinguiculosa* subsp. *teretifolia*, *Acacia pravifolia*, *Kunzea affinis*, *Spyridium cordatum*, *Stylidium breviscapum*





<b>Relevé:</b>	104	<b>Latitude:</b>	237358	<b>Vegetation Structure:</b>	
<b>Date:</b>	9/9/2021	<b>Longitude:</b>	6272358	<b>-Upper (u):</b>	4m, <10%
<b>Soil Colour:</b>	orange	<b>Condition:</b>	Excellent	<b>-Middle (m):</b>	2m, 10-30%
<b>Soil Type:</b>	duplex	<b>Fire Age:</b>	long unburnt	<b>-Ground (g):</b>	<0.5m, 30-70%
<b>Rock Type:</b>	quartz and ironstone				
<b>Vegetation Type:</b>	<i>Eple/Bmed</i>				

**Site Comments:**

Taxon	Layer	Dominant	Cover	Status	Comments
<i>Eucalyptus pleurocarpa</i>	u				
<i>Eucalyptus tetraptera</i>	u				
<i>Acacia gonophylla</i>	m				
<i>Banksia cirsioides</i>	m				
<i>Banksia media</i>	m				
<i>Beaufortia micrantha</i>	m				
<i>Beaufortia schaueri</i>	m				
<i>Boronia inornata</i>	m				
<i>Boronia oxyantha</i> var. <i>brevicalyx</i>	m				
<i>Daviesia anceps</i>	m				

<i>Daviesia benthamii</i>	m
<i>Daviesia teretifolia</i>	m
<i>Gompholobium confertum</i>	m
<i>Grevillea patentiloba</i> subsp. <i>patentiloba</i>	m
<i>Hakea lasiantha</i>	m
<i>Hakea lissocarpha</i>	m
<i>Hakea marginata</i>	m
<i>Isopogon</i> sp. Fitzgerald River (D.B. Foreman 813)	m
<i>Melaleuca bracteosa</i>	m
<i>Melaleuca rigidifolia</i>	m
<i>Melaleuca subfalcata</i>	m
<i>Pultenaea indira</i>	m
<i>Tetrapora verrucosa</i>	m
<i>Patersonia occidentalis</i>	g

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**Relevé:** 105                      **Latitude:** 237569                      **Vegetation Structure:**  
**Date:** 10/9/2021                      **Longitude:** 6272592                      **-Upper (u):** 4m, 10-30%  
**Soil Colour:** orange                      **Condition:** Excellent                      **-Middle (m):** 1.5m, 30-70%  
**Soil Type:** clay                      **Fire Age:** long unburnt                      **-Ground (g):** 0.5m, 10-30%  
**Rock Type:** granitic rock  
**Vegetation Type:** *Epro/Mspp*

**Site Comments:**

Taxon	Layer	Dominant	Cover	Status	Comments
<i>Eucalyptus cernua</i>	u				
<i>Eucalyptus flocktoniae</i>	u				
<i>Eucalyptus uncinata</i>	u				
<i>Acacia crassuloides</i>	m				
<i>Acacia ingrata</i>	m				
<i>Acrotriche cordata</i>	m				
<i>Alyxia buxifolia</i>	m				
<i>Boronia inornata</i>	m				
<i>Cassyltha melantha</i>	m				
<i>Cooperookia strophiolata</i>	m				

<i>Daviesia anceps</i>	m
<i>Dodonaea concinna</i>	m
<i>Exocarpos aphyllus</i>	m
<i>Grevillea pectinata</i>	m
<i>Halgania andromedifolia</i>	m
<i>Leucopogon infuscatus</i>	m
<i>Melaleuca cucullata</i>	m
<i>Melaleuca lateriflora</i>	m
<i>Melaleuca marginata</i>	m
<i>Pultenaea purpurea</i>	m
<i>Lepidosperma gahnoides</i>	g
<i>Lepidosperma tuberculatum</i>	g

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<i>Hakea laurina</i>	m
<i>Hakea lissocarpha</i>	m
<i>Hakea marginata</i>	m
<i>Hibbertia acerosa</i>	m
<i>Leucopogon infuscatus</i>	m
<i>Melaleuca bracteosa</i>	m
<i>Melaleuca hamata</i>	m
<i>Melaleuca rigidifolia</i>	m
<i>Tetrapora verrucosa</i>	m

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<i>Melaleuca stramentosa</i>	m	
<i>Petrophile squamata</i>	m	
<i>Taxandria spathulata</i>	m	
<i>Tetrapora verrucosa</i>	m	
<i>Thomasia foliosa</i>	m	
<i>Caladenia attingens</i>	g	
<i>Gahnia ancistrophylla</i>	g	
<i>Hydrocotyle tuberculata</i>	g	2
<i>Lepidosperma tuberculatum</i>	g	
<i>Lomandra micrantha</i> subsp. <i>teretifolia</i>	g	

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**Relevé:** 108                      **Latitude:** 237777                      **Vegetation Structure:**  
**Date:** 10/9/2021                      **Longitude:** 6272373                      **-Upper (u):** 5m, 10-30%  
**Soil Colour:** grey                      **Condition:** Excellent                      **-Middle (m):** 2m, 10-30%  
**Soil Type:** sandy clay                      **Fire Age:** long unburnt                      **-Ground (g):** 0.5m, 10-30%  
**Rock Type:** outcrop schist  
**Vegetation Type:** *Eple/Bmed*

**Site Comments:**

Taxon	Layer	Dominant	Cover	Status	Comments
<i>Eucalyptus pleurocarpa</i>	u				
<i>Eucalyptus tetraptera</i>	u				
<i>Acacia gonophylla</i>	m				
<i>Acacia subcaerulea</i>	m				
<i>Banksia cirsioides</i>	m				
<i>Banksia lemniiana</i>	m				
<i>Boronia tetrandra</i>	m				
<i>Goodenia scapigera</i>	m				
<i>Grevillea patentiloba</i> subsp. <i>patentiloba</i>	m				
<i>Hakea commutata</i>	m				

<i>Lasiopetalum indutum</i>	m
<i>Lasiopetalum rosmarinifolium</i>	m
<i>Leucopogon</i> sp. Coujinup (M.A. Burgman 1085)	m
<i>Melaleuca elliptica</i>	m
<i>Melaleuca hamata</i>	m
<i>Melaleuca rigidifolia</i>	m
<i>Melaleuca stramentosa</i>	m
<i>Melaleuca subfalcata</i>	m
<i>Conostylis bealiana</i>	g
<i>Lepidosperma sanguinolentum</i>	g
<i>Lepidosperma tuberculatum</i>	g

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**Relevé:** 109                      **Latitude:** 238314                      **Vegetation Structure:**  
**Date:** 13/9/2021                      **Longitude:** 6272414                      **-Upper (u):** 5m, 10-30%  
**Soil Colour:** grey                      **Condition:** Excellent                      **-Middle (m):** 3m, 30-70%  
**Soil Type:** sandy clay                      **Fire Age:** long unburnt                      **-Ground (g):** 0.5m, 10-30%  
**Rock Type:** granitic gravel  
**Vegetation Type:** *Epil*

**Site Comments:**

Taxon	Layer	Dominant	Cover	Status	Comments
<i>Eucalyptus flocktoniae</i>	u				
<i>Eucalyptus leptocalyx</i>	u				
<i>Eucalyptus pileata</i>	u				
<i>Eucalyptus proxima</i>	u				
<i>Acacia glaucoptera</i>	m				
<i>Cassythra melantha</i>	m				
<i>Cooperhooikia strophiolata</i>	m				
<i>Daviesia nematophylla</i>	m				
<i>Hakea commutata</i>	m				
<i>Melaleuca cucullata</i>	m				

<i>Melaleuca hamata</i>	m
<i>Melaleuca marginata</i>	m
<i>Melaleuca pauperiflora</i>	m
<i>Lepidosperma</i> sp. Ravensthorpe (G.F. Craig 5188)	g

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<b>Relevé:</b>	110	<b>Latitude:</b>	238456	<b>Vegetation Structure:</b>	
<b>Date:</b>	13/9/2021	<b>Longitude:</b>	6272540	<b>-Upper (u):</b>	8m, 30-70%
<b>Soil Colour:</b>	dark brown	<b>Condition:</b>	Excellent	<b>-Middle (m):</b>	2m, <10%
<b>Soil Type:</b>	loam	<b>Fire Age:</b>	long unburnt	<b>-Ground (g):</b>	0.5m, <10%
<b>Rock Type:</b>	nil				
<b>Vegetation Type:</b>	<i>Ecli</i>				

**Site Comments:**

Taxon	Layer	Dominant	Cover	Status	Comments
<i>Eucalyptus clivicola</i>	u				
<i>Eucalyptus platypus</i>	u				
<i>Acacia subcaerulea</i>	m				
<i>Dodonaea concinna</i>	m				
<i>Dodonaea trifida</i>	m				
<i>Dodonaea viscosa</i>	m				
<i>Gastrolobium musaceum</i>	m				
<i>Hakea laurina</i>	m				
<i>Lasiopetalum indutum</i>	m				
<i>Melaleuca acuminata</i>	m				



<i>Petrophile fastigiata</i>	m
<i>Verticordia chrysantha</i>	m
<i>Lepidosperma sanguinolentum</i>	g
<i>Lepidosperma</i> sp. Ravensthorpe (G.F. Craig 5188)	g
<i>Thysanotus patersonii</i>	g

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<b>Relevé:</b>	111	<b>Latitude:</b>	238690	<b>Vegetation Structure:</b>	
<b>Date:</b>	13/9/2021	<b>Longitude:</b>	6272874	<b>-Upper (u):</b>	3m, 30-70%
<b>Soil Colour:</b>	orange	<b>Condition:</b>	Excellent	<b>-Middle (m):</b>	2m, 30-70%
<b>Soil Type:</b>	clay	<b>Fire Age:</b>	long unburnt	<b>-Ground (g):</b>	0.5m, 10-30%
<b>Rock Type:</b>	granitic gravel				
<b>Vegetation Type:</b>	<i>Mallee/Mspp</i>				

**Site Comments:**

Taxon	Layer	Dominant	Cover	Status	Comments
<i>Eucalyptus sporadica</i>	u				
<i>Acacia mimica</i>	m				
<i>Allocasuarina campestris</i>	m				
<i>Boronia scabra</i>	m				
<i>Callitris drummondii</i>	m				
<i>Calothamnus quadrifidus</i>	m				
<i>Calytrix leschenaultii</i>	m				
<i>Dampiera lavandulacea</i>	m				
<i>Euryomyrtus serpyllifolia</i>	m				
<i>Kunzea affinis</i>	m				

<i>Leucopogon concinnus</i>	m	
<i>Melaleuca hamata</i>	m	
<i>Petrophile fastigiata</i>	m	
<i>Santalum lanceolatum</i>	m	
<i>Lepidosperma</i> sp. Mt Short (S. Kem et al. LCH 17510)	g	1
<i>Neurachne alopecuroidea</i>	g	
<i>Phyllanthus calycinus</i>	g	
<i>Pterostylis vittata</i>	g	
<i>Pyrorchis nigricans</i>	g	
<i>Schoenus acuminatus</i>	g	
<i>Schoenus odontocarpus</i>	g	
<i>Stylidium breviscapum</i>	g	
<i>Stylidium caespitosum</i>	g	
<i>Netrostylis</i> sp. Mt Madden (C.D. Turley 40 BP/897)	g	

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**Relevé:** 112                      **Latitude:** 238346                      **Vegetation Structure:**  
**Date:** 13/9/2021                      **Longitude:** 6272713                      **-Upper (u):** 4m, 30-70%  
**Soil Colour:** grey                      **Condition:** Excellent                      **-Middle (m):** 2m, 10-30%  
**Soil Type:** sand                      **Fire Age:** long unburnt                      **-Ground (g):** 0.5m, <10%  
**Rock Type:** laterite gravel  
**Vegetation Type:** *Mallee/Mspp*

**Site Comments:**

Taxon	Layer	Dominant	Cover	Status	Comments
<i>Eucalyptus flocktoniae</i>	u				
<i>Eucalyptus leptocalyx</i>	u				
<i>Eucalyptus phenax</i>	u				
<i>Acacia gonophylla</i>	m				
<i>Boronia inornata</i>	m				
<i>Cassyltha melantha</i>	m				
<i>Daviesia benthamii</i>	m				
<i>Grevillea anethifolia</i>	m				
<i>Lasiopetalum rosmarinifolium</i>	m				
<i>Melaleuca hamata</i>	m				



<i>Melaleuca lateriflora</i>	m
<i>Melaleuca rigidifolia</i>	m
<i>Rhadinothamnus rudis</i> subsp. <i>amblycarpus</i>	m
<i>Tetrapora verrucosa</i>	m
<i>Eleocharis acuta</i>	g
<i>Gahnia ancistrophylla</i>	g
<i>Lepidosperma gahnioides</i>	g

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<b>Relevé:</b>	113	<b>Latitude:</b>	237787	<b>Vegetation Structure:</b>	
<b>Date:</b>	14/9/2021	<b>Longitude:</b>	6273025	<b>-Upper (u):</b>	4m, <10%
<b>Soil Colour:</b>	orange and brown	<b>Condition:</b>	Excellent	<b>-Middle (m):</b>	2m, 30-70%
<b>Soil Type:</b>	sandy clay	<b>Fire Age:</b>	long unburnt	<b>-Ground (g):</b>	0.5m, <10%
<b>Rock Type:</b>	quartz and granitic gravel				
<b>Vegetation Type:</b>	<i>Mallee/Mspp</i>				

**Site Comments:**

Taxon	Layer	Dominant	Cover	Status	Comments
<i>Eucalyptus flocktoniae</i>	u				
<i>Eucalyptus phaenophylla</i>	u				
<i>Eucalyptus phenax</i>	u				
<i>Eucalyptus proxima</i>	u				
<i>Eucalyptus uncinata</i>	u				
<i>Dampiera angulata</i>	m				
<i>Gastrolobium musaceum</i>	m				
<i>Hibbertia acerosa</i>	m				
<i>Leucopogon fimbriatus</i>	m				
<i>Melaleuca hamata</i>	m				

<i>Melaleuca rigidifolia</i>	m
<i>Tetrapora verrucosa</i>	m
<i>Gahnia ancistrophylla</i>	g
<i>Lepidosperma tuberculatum</i>	g

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**Relevé:** 114                      **Latitude:** 238259                      **Vegetation Structure:**  
**Date:** 14/9/2021                      **Longitude:** 6273409                      **-Upper (u):** 4m, <10%  
**Soil Colour:** orange                      **Condition:** Excellent                      **-Middle (m):** 3m, >70%  
**Soil Type:** clay                      **Fire Age:** long unburnt                      **-Ground (g):** <0.5m, <10%  
**Rock Type:** nil  
**Vegetation Type:** *Eflo/Mcuc*

**Site Comments:**

Taxon	Layer	Dominant	Cover	Status	Comments
<i>Eucalyptus phenax</i>	u				
<i>Acacia glaucoptera</i>	m				
<i>Cassyltha melantha</i>	m				
<i>Hakea laurina</i>	m				
<i>Melaleuca acuminata</i>	m				
<i>Melaleuca cucullata</i>	m				
<i>Melaleuca hamata</i>	m				
<i>Senna artemisioides</i>	m				
<i>Templetonia retusa</i>	m				
<i>Calandrinia brevipedata</i>	g				



<i>Hydrocotyle tuberculata</i>	g	2
<i>Lepidosperma</i> sp. Ravensthorpe (G.F. Craig 5188)	g	
* <i>Lysimachia arvensis</i>	g	

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**Relevé:** 116                      **Latitude:** 237979                      **Vegetation Structure:**  
**Date:** 14/9/2021                      **Longitude:** 6272838                      **-Upper (u):** 4m, <10%  
**Soil Colour:** yellow                      **Condition:** Excellent                      **-Middle (m):** 2m, 30-70%  
**Soil Type:** sand                      **Fire Age:** long unburnt                      **-Ground (g):** <0.5m, <10%  
**Rock Type:** quartz gravel  
**Vegetation Type:** *Eple/Bmed*

**Site Comments:**

Taxon	Layer	Dominant	Cover	Status	Comments
<i>Eucalyptus flocktoniae</i>	u				
<i>Eucalyptus pleurocarpa</i>	u				
<i>Eucalyptus suggrandis</i>	u				
<i>Banksia media</i>	m				
<i>Beaufortia schaueri</i>	m				
<i>Boronia octandra</i>	m				
<i>Calothamnus gracilis</i>	m				
<i>Cooperhooikia polygalacea</i>	m				
<i>Dampiera angulata</i>	m				
<i>Goodenia concinna</i>	m				

<i>Hakea lasiantha</i>	m
<i>Hakea lissocarpha</i>	m
<i>Hakea marginata</i>	m
<i>Isopogon</i> sp. Fitzgerald River (D.B. Foreman 813)	m
<i>Melaleuca rigidifolia</i>	m
<i>Taxandria spathulata</i>	m
<i>Tetrapora verrucosa</i>	m
<i>Trymalium elachophyllum</i>	m

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**Relevé:** 117                      **Latitude:** 236353                      **Vegetation Structure:**  
**Date:** 15/9/2021                      **Longitude:** 6273926                      **-Upper (u):** 5m, 10-30%  
**Soil Colour:** orange                      **Condition:** Excellent                      **-Middle (m):** 1-2m, 30-70%  
**Soil Type:** sand                      **Fire Age:** long unburnt                      **-Ground (g):** 0.5m, 10-30%  
**Rock Type:** quartz gravel  
**Vegetation Type:** *Eple/Bmed*

**Site Comments:**

Taxon	Layer	Dominant	Cover	Status	Comments
<i>Eucalyptus incrassata</i>	u				
<i>Eucalyptus leptocalyx</i>	u				
<i>Eucalyptus pleurocarpa</i>	u				
<i>Eucalyptus suggrandis</i>	u				
<i>Acacia ingrata</i>	m				
<i>Acrotriche cordata</i>	m				
<i>Andersonia parvifolia</i>	m				
<i>Banksia media</i>	m				
<i>Banksia tenuis</i>	m				
<i>Beaufortia schaueri</i>	m				

<i>Boronia inornata</i>	m
<i>Chamelaucium ciliatum</i>	m
<i>Cooperhooikia polygalacea</i>	m
<i>Dampiera angulata</i>	m
<i>Daviesia anceps</i>	m
<i>Daviesia teretifolia</i>	m
<i>Gastrolobium musaceum</i>	m
<i>Gompholobium confertum</i>	m
<i>Grevillea oligantha</i>	m
<i>Grevillea patentiloba</i> subsp. <i>patentiloba</i>	m
<i>Hakea laurina</i>	m
<i>Hakea marginata</i>	m
<i>Hibbertia acerosa</i>	m
<i>Hibbertia gracilipes</i>	m
<i>Isopogon</i> sp. Fitzgerald River (D.B. Foreman 813)	m
<i>Kunzea jucunda</i>	m
<i>Leucopogon fimbriatus</i>	m
<i>Leucopogon infuscatus</i>	m
<i>Melaleuca hamata</i>	m
<i>Melaleuca lateriflora</i>	m
<i>Melaleuca rigidifolia</i>	m
<i>Melaleuca subfalcata</i>	m
<i>Persoonia teretifolia</i>	m
<i>Petrophile squamata</i>	m
<i>Spyridium cordatum</i>	m
<i>Tetrapora verrucosa</i>	m

<i>Amphipogon turbinatus</i>	g	
<i>Gahnia aristata</i>	g	
<i>Lepidosperma</i> sp. Mt Short (S. Kem et al. LCH 17510)	g	1
<i>Lomandra micrantha</i> subsp. <i>teretifolia</i>	g	

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**Relevé:** 118                      **Latitude:** 236625                      **Vegetation Structure:**  
**Date:** 15/9/2021                      **Longitude:** 6274116                      **-Upper (u):** 4m, 10-30%  
**Soil Colour:** orange and brown                      **Condition:** Excellent                      **-Middle (m):** 1-2m, 30-70%  
**Soil Type:** clay                      **Fire Age:** long unburnt                      **-Ground (g):** 0.5m, 10-30%  
**Rock Type:** granitic gravel  
**Vegetation Type:** *Epro/Mspp*

**Site Comments:**

Taxon	Layer	Dominant	Cover	Status	Comments
<i>Eucalyptus flocktoniae</i>	u				
<i>Eucalyptus phenax</i>	u				
<i>Eucalyptus proxima</i>	u				
<i>Acacia glaucoptera</i>	m				
<i>Boronia oxyantha</i> var. <i>brevicalyx</i>	m				
<i>Boronia scabra</i>	m				
<i>Comesperma volubile</i>	m				
<i>Cooperhookea polygalacea</i>	m				
<i>Daviesia benthamii</i>	m				
<i>Dodonaea pinifolia</i>	m				



<i>Exocarpos aphyllus</i>	m
<i>Grevillea oligantha</i>	m
<i>Grevillea patentiloba</i> subsp. <i>patentiloba</i>	m
<i>Hakea commutata</i>	m
<i>Hibbertia acerosa</i>	m
<i>Leucopogon infuscatus</i>	m
<i>Melaleuca calycina</i>	m
<i>Melaleuca cliffortioides</i>	m
<i>Melaleuca hamata</i>	m
<i>Melaleuca lateriflora</i>	m
<i>Melaleuca rigidifolia</i>	m
<i>Templetonia sulcata</i>	m
<i>Gahnia aristata</i>	g
<i>Lepidosperma fimbriatum</i>	g
<i>Lepidosperma gahnioides</i>	g

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**Species outside quadrat/relevé:** *Chorizema nervosum*, *Cooperhooikia strophiolata*, *Melaleuca cucullata*









<i>Calytrix tetragona</i>	m
<i>Cassyltha melantha</i>	m
<i>Cooperookia polygalacea</i>	m
<i>Hakea laurina</i>	m
<i>Hakea lissocarpha</i>	m
<i>Halgania anagalloides</i> var. Southern (A.E. Orchard 1609)	m
<i>Kunzea affinis</i>	m
<i>Kunzea cincinnata</i>	m
<i>Marianthus bicolor</i>	m
<i>Marianthus microphyllus</i>	m
<i>Melaleuca elliptica</i>	m
<i>Melaleuca hamata</i>	m
<i>Melaleuca haplantha</i>	m
<i>Melaleuca lateriflora</i>	m
<i>Melaleuca rigidifolia</i>	m
<i>Olearia imbricata</i>	m
<i>Spyridium cordatum</i>	m
<i>Tetrapora verrucosa</i>	m
<i>Verticordia acerosa</i> var. <i>preissii</i>	m
<i>Argentipallium niveum</i>	g
<i>Chamaescilla corymbosa</i>	g
<i>Chorizandra enodis</i>	g
<i>Desmocladius lateriflorus</i>	g
<i>Gahnia ancistrophylla</i>	g
<i>Glischrocaryon roei</i>	g
<i>Ozothamnus lepidophyllus</i>	g

# 11 APPENDIX F - Conservation Significant Flora Locations

TaxonName	Abundance	WAConStat	DateObs	Comments	Lat	Long
<i>Acacia errabunda</i>	5	P4	15/09/2021		-33.64521	120.17056
<i>Andersonia</i> sp.	1	OS	10/09/2021		-33.65330	120.17181
<i>Andersonia</i> sp.	1	OS	10/09/2021		-33.65265	120.17360
<i>Eucalyptus desmondensis</i>	1	P4	8/09/2021		-33.65045	120.17025
<i>Eucalyptus desmondensis</i>	1	P4	8/09/2021		-33.65049	120.17021
<i>Eucalyptus desmondensis</i>	1	P4	8/09/2021		-33.65050	120.17044
<i>Eucalyptus desmondensis</i>	5	P4	8/09/2021		-33.65046	120.17047
<i>Eucalyptus desmondensis</i>	1	P4	8/09/2021		-33.65045	120.17031
<i>Eucalyptus desmondensis</i>	1	P4	8/09/2021		-33.65031	120.17051
<i>Eucalyptus desmondensis</i>	1	P4	8/09/2021		-33.65029	120.17051
<i>Eucalyptus desmondensis</i>	1	P4	8/09/2021		-33.65027	120.17049
<i>Eucalyptus desmondensis</i>	1	P4	8/09/2021		-33.65025	120.17044
<i>Eucalyptus desmondensis</i>	1	P4	8/09/2021		-33.65023	120.17042
<i>Eucalyptus desmondensis</i>	1	P4	8/09/2021		-33.65022	120.17040
<i>Eucalyptus desmondensis</i>	20	P4	8/09/2021		-33.65022	120.17037
<i>Eucalyptus desmondensis</i>	100	P4	8/09/2021		-33.65011	120.17044
<i>Eucalyptus desmondensis</i>	5	P4	8/09/2021		-33.65008	120.17070
<i>Eucalyptus desmondensis</i>	5	P4	8/09/2021		-33.65022	120.17065
<i>Eucalyptus desmondensis</i>	8	P4	8/09/2021		-33.65044	120.17072
<i>Eucalyptus desmondensis</i>	1	P4	8/09/2021		-33.65017	120.17095
<i>Eucalyptus desmondensis</i>	1	P4	8/09/2021		-33.65015	120.17105
<i>Eucalyptus desmondensis</i>	1	P4	8/09/2021		-33.65017	120.17109
<i>Eucalyptus desmondensis</i>	10	P4	8/09/2021		-33.65013	120.17113
<i>Eucalyptus desmondensis</i>	25	P4	8/09/2021		-33.64995	120.17111
<i>Eucalyptus desmondensis</i>	10	P4	8/09/2021		-33.64994	120.17130
<i>Eucalyptus desmondensis</i>	10	P4	8/09/2021		-33.64986	120.17143
<i>Eucalyptus desmondensis</i>	10	P4	8/09/2021		-33.64963	120.17156
<i>Eucalyptus desmondensis</i>	5	P4	15/09/2021		-33.64116	120.16443
<i>Eucalyptus desmondensis</i>	1	P4	15/09/2021		-33.64133	120.16452
<i>Eucalyptus desmondensis</i>	20	P4	15/09/2021		-33.64136	120.16443
<i>Eucalyptus desmondensis</i>	1	P4	15/09/2021		-33.64139	120.16460
<i>Eucalyptus desmondensis</i>	1	P4	15/09/2021		-33.64230	120.16603
<i>Eucalyptus desmondensis</i>	10	P4	15/09/2021		-33.64231	120.16600
<i>Eucalyptus desmondensis</i>	1	P4	15/09/2021		-33.64242	120.16609
<i>Eucalyptus desmondensis</i>	1	P4	15/09/2021		-33.64242	120.16616
<i>Eucalyptus desmondensis</i>	3	P4	15/09/2021		-33.64233	120.16622
<i>Eucalyptus desmondensis</i>	1	P4	15/09/2021		-33.64242	120.16630
<i>Eucalyptus desmondensis</i>	1	P4	15/09/2021		-33.64243	120.16636
<i>Eucalyptus desmondensis</i>	10	P4	15/09/2021		-33.64249	120.16628
<i>Eucalyptus desmondensis</i>	2	P4	15/09/2021		-33.64249	120.16635
<i>Eucalyptus desmondensis</i>	10	P4	15/09/2021		-33.64268	120.16654
<i>Eucalyptus desmondensis</i>	7	P4	15/09/2021		-33.64265	120.16669
<i>Eucalyptus desmondensis</i>	5	P4	15/09/2021		-33.64276	120.16682
<i>Eucalyptus desmondensis</i>	2	P4	15/09/2021		-33.64282	120.16685
<i>Eucalyptus desmondensis</i>	7	P4	15/09/2021		-33.64286	120.16692
<i>Eucalyptus desmondensis</i>	4	P4	15/09/2021		-33.64285	120.16697
<i>Eucalyptus desmondensis</i>	1	P4	15/09/2021		-33.64298	120.16708
<i>Eucalyptus desmondensis</i>	1	P4	15/09/2021		-33.64301	120.16713
<i>Eucalyptus desmondensis</i>	1	P4	15/09/2021		-33.64305	120.16719
<i>Eucalyptus desmondensis</i>	1	P4	15/09/2021		-33.64306	120.16726
<i>Eucalyptus desmondensis</i>	1	P4	15/09/2021		-33.64304	120.16730
<i>Grevillea punctata</i>	1	P3	8/09/2021		-33.65332	120.16634
<i>Grevillea punctata</i>	1	P3	8/09/2021		-33.65329	120.16631
<i>Grevillea punctata</i>	1	P3	8/09/2021		-33.65327	120.16636
<i>Grevillea punctata</i>	1	P3	8/09/2021		-33.65338	120.16667
<i>Grevillea punctata</i>	1	P3	8/09/2021		-33.65293	120.16689
<i>Grevillea punctata</i>	1	P3	8/09/2021		-33.65292	120.16691
<i>Grevillea punctata</i>	1	P3	8/09/2021		-33.65288	120.16692
<i>Grevillea punctata</i>	1	P3	8/09/2021		-33.65285	120.16696
<i>Grevillea punctata</i>	1	P3	8/09/2021		-33.65284	120.16697
<i>Grevillea punctata</i>	1	P3	8/09/2021		-33.65215	120.16797
<i>Grevillea punctata</i>	1	P3	8/09/2021		-33.65215	120.16799

TaxonName	Abundance	WAConStat	DateObs	Comments	Lat	Long
<i>Hydrocotyle tuberculata</i>	10	P2	8/09/2021	Colony 10+	-33.64998	120.17180
<i>Hydrocotyle tuberculata</i>	10	P2	13/09/2021	Colony 10+	-33.65323	120.18201
<i>Hydrocotyle tuberculata</i>	10	P2	13/09/2021	Colony 10+	-33.65115	120.18167
<i>Hydrocotyle tuberculata</i>	10	P2	14/09/2021	Colony 10+	-33.64875	120.17494
<i>Hydrocotyle tuberculata</i>	10	P2	14/09/2021	Colony 10+	-33.64955	120.17968
<i>Hydrocotyle tuberculata</i>	10	P2	15/09/2021	Colony 10+	-33.64262	120.16634
<i>Lepidosperma</i> sp. Elverdton (R. Jasper et al. LCH 16844)	1	P1	10/09/2021		-33.65557	120.17175
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	100	P1	8/09/2021	Colony 100+	-33.65054	120.17028
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	10	P1	9/09/2021	Colony 10+	-33.65240	120.17347
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	10	P1	10/09/2021	Colony 10+	-33.65297	120.17354
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	10	P1	13/09/2021	Colony 10+	-33.65268	120.18301
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	10	P1	13/09/2021	Colony 10+	-33.65219	120.18263
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	10	P1	13/09/2021	Colony 10+	-33.65272	120.18108
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	10	P1	13/09/2021	Colony 10+	-33.65143	120.18145
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	10	P1	13/09/2021	Colony 10+	-33.65051	120.18096
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	10	P1	14/09/2021	Colony 10+	-33.64948	120.17744
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	10	P1	14/09/2021	Colony 10+	-33.65034	120.17985
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	10	P1	15/09/2021	Colony 10+	-33.64185	120.15805
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	10	P1	15/09/2021	Colony 10+	-33.63996	120.16706
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	10	P1	15/09/2021	Colony 10+	-33.63990	120.16716
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	10	P1	15/09/2021	Colony 10+	-33.64290	120.16705
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	10	P1	15/09/2021	Colony 10+	-33.64350	120.16799
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	10	P1	15/09/2021	Colony 10+	-33.64448	120.16915
<i>Lepidosperma</i> sp. Mt Short (S. Kern et al. LCH 17510)	10	P1	15/09/2021	Colony 10+	-33.64646	120.17130
<i>Melaleuca penicula</i>	2	P4	15/09/2021		-33.64130	120.16444
<i>Melaleuca penicula</i>	2	P4	15/09/2021		-33.64138	120.16443
<i>Melaleuca penicula</i>	3	P4	15/09/2021		-33.64138	120.16443
<i>Pultenaea brachyphylla</i>	5	P2	10/09/2021		-33.65710	120.16636
<i>Tricostularia</i> sp.	1	OS	8/09/2021		-33.65128	120.16905