



**Great Eastern Highway Coates  
Gully (Stage 1 and 2) Project**

# **Detailed Flora and Vegetation Report**

Prepared for  
**Main Roads WA**

March 2020

● people ● planet ● professional

Document Reference	Revision	Prepared by	Reviewed by	Admin Review	Submitted to Client	
					Copies	Date
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3564AA_Rev3	Client Final	N. Whittington	S. Walker	S. Hick	1x electronic (email)	19/03/2020

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# Executive Summary

Main Roads WA commissioned 360 Environmental Pty Ltd to undertake a detailed flora and vegetation survey to support the proposed upgrades of Coates Gully Bridges, Stages 1 and 2. This survey was completed within the defined area, along Great Eastern Highway between Linley Valley Road (SLK 55.83) and Martin Road (SLK 68.74). The Survey Area is approximately 13 km long and covers approximately 59 hectares.

The detailed flora and vegetation survey undertaken between the 9<sup>th</sup> to the 11<sup>th</sup> of October 2019 recorded the floristic composition and vegetation types from seven quadrats and five relevés and additional mapping notes. The survey recorded a total of 161 taxa from 119 genera across 45 families.

No Threatened flora species pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* and/or gazetted as Threatened/Declared Rare Flora pursuant to the *Biodiversity and Conservation Act 2016* were recorded during the survey.

Three Priority species as listed by DBCA *Tetratheca pilifera* (P3), *Lechenaultia hortii* (P2) and *Grevillea olivacea* (P4) were recorded within the Survey Area. *Grevillea olivacea* (P4) has been planted and therefore is not considered to have conservation significance.

A total of 26 vegetation types was mapped and covered 27.14 ha of the Survey Area. These ranged from intact woodlands in Excellent condition to Completely Degraded scattered mature trees over introduced weed species. The Survey Area also contained 31.86 ha of roads and cleared areas.

A total of 38 introduced species were recorded within the Survey Area, representing 23.6% of the total taxa recorded. Three of these species in the Arum Lily (*\*Zantedeschia aethiopica*), One-leaf Cape Tulip (*\*Moraea flaccida*) and Bridal Creeper (*\*Asparagus asparagoides*) are listed as Declared Pests under the BAM Act 2007. Bridal creeper is also listed as a Weed of National Significance.

Further investigation of vegetation types EwCc and EwBsq was completed based on the key diagnostic characteristics outlined in the *Eucalypt Woodland of the Western Australian Wheatbelt Conservation Advice* (Department of the Environment, 2015). The outcomes from the assessment can conclude that even though vegetation types EwCc and EwBsq meet several of the key diagnostic characteristics of Eucalypt woodlands, the Survey Area is located with the 600-1000 mm rainfall isohyet and therefore outside the rainfall zone considered to contain the TEC. As stated in the Conservation Advice, Eucalypt Woodlands of the Western Australian Wheatbelt generally falls within the 300 to 600 mm average annual rainfall. Based on this information, the vegetation within the Survey Area is not considered to be the *TEC Eucalypt Woodlands of the Western Australian Wheatbelt*.

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# 1 Introduction

## 1.1 The Project

Main Roads WA (Main Roads) commissioned 360 Environmental Pty Ltd (360 Environmental) to undertake a detailed flora and vegetation survey to support the proposed upgrades of Coates Gully Bridges, Stages 1 and 2 (herein known as the Project). This survey was completed within the defined area, along Great Eastern Highway between Linley Valley Road (SLK 55.8) and Martin Road 3 (SLK 68.74) (herein referred to as the Survey Area).

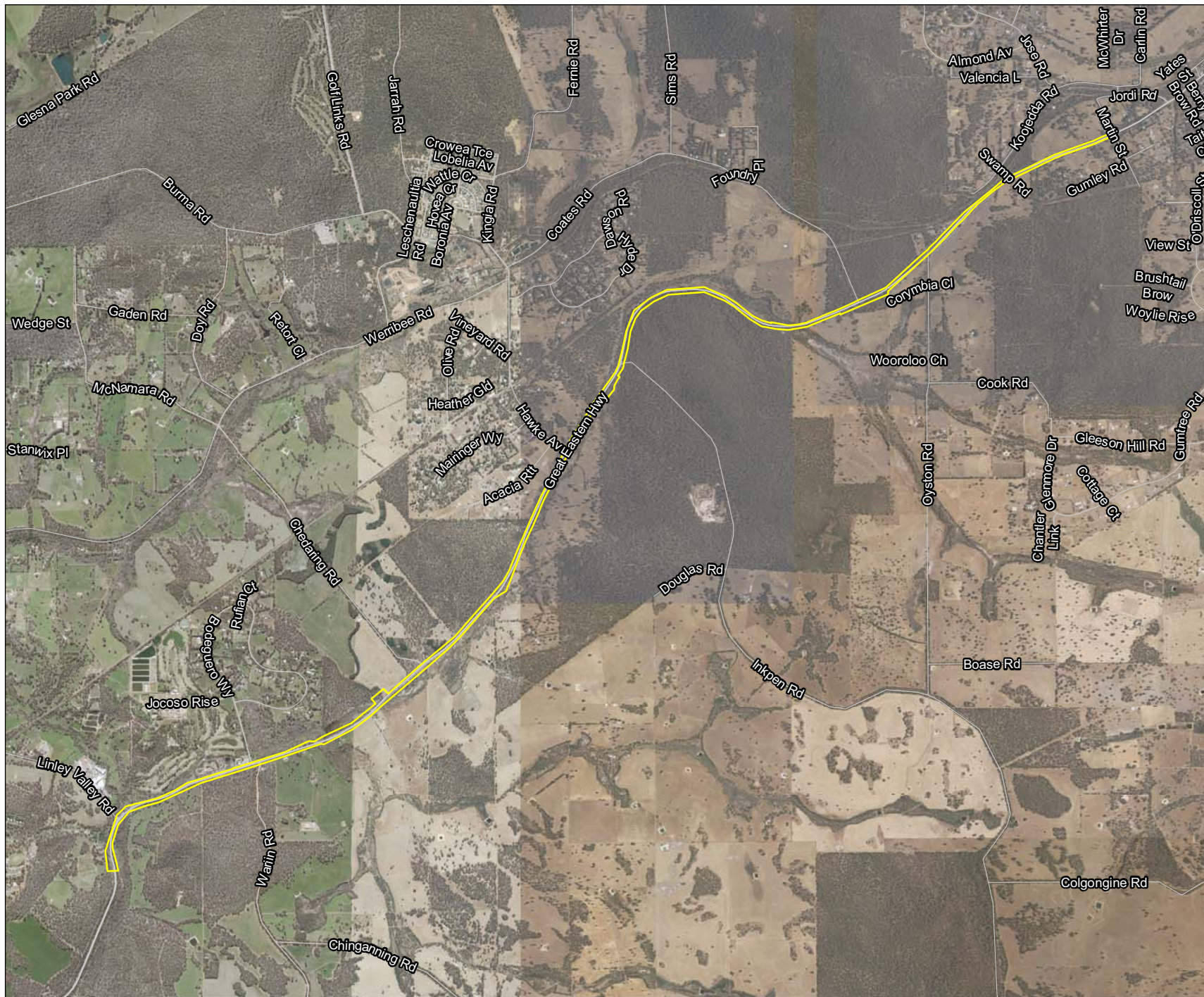
The Survey Area is approximately 13 km long and covers approximately 60.4 hectares (ha) (Figure 1).

## 1.2 Objectives and Scope

The purpose of the survey is to delineate key flora and vegetation values within the Survey Area and identify potential environmental sensitivities that may impact the Project.

The scope of works includes:

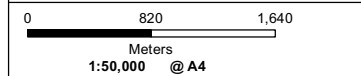
- Desktop Assessment
- Field Survey – an in season detailed flora and vegetation survey
- Post Survey Debrief Email
- Biological Report
- GIS Spatial Data – according to Main Roads and IBSA geospatial requirements.



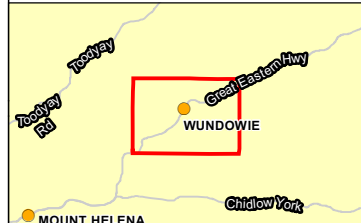
- Legend**
- Survey Area Boundary
  - State Road
  - Local Road

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
 - LOCALITY MAP SOURCED LANDGATE 2017  
 - OTHER DATA SOURCED LANDGATE 2018  
 - AERIAL PHOTOGRAPHY SOURCED LANDGATE 2018  
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**LOCALITY MAP**



PROJECT ID 3564		DATE 18/03/2020	
HORIZONTAL DATUM AND PROJECTION GDA 1994 MGA Zone 50			
CREATED LF	CHECKED NM	APPROVED NW	REVISION 3

**Main Roads WA**  
**Great Eastern Highway, Coates Gully (SLK 55.8 –68.5)**  
**Detailed Flora and Vegetation Survey**

**Figure 1 Survey Area**

## 2 Background

### 2.1 Protection of Flora and Vegetation

Western Australian flora and fauna is protected formally and informally by legislative and non-legislative measures, which are as follows:

Legislative measures:

- *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*
- *WA Biodiversity Conservation Act 2016*
- *WA Environmental Protection Act 1986*
- *WA Biosecurity and Agriculture Management Act 2007 (BAM Act).*

Non-legislative measures:

- WA Department of Biodiversity Conservation and Attractions (DBCA) Priority lists for fauna, flora and ecological communities
- Weeds of National Significance (WoNS) and
- Recognition of locally significant populations by DBCA.

### 2.2 Biophysical Environment

#### 2.2.1 Climate

The closest long-term Bureau of Meteorology (BoM) weather station with a complete dataset is Northam (Station 010111), located approximately 28 km north east of the centre of the Survey Area. Although there were closer weather stations near to the Survey Area; their incomplete climate data was not sufficient for interpretation.

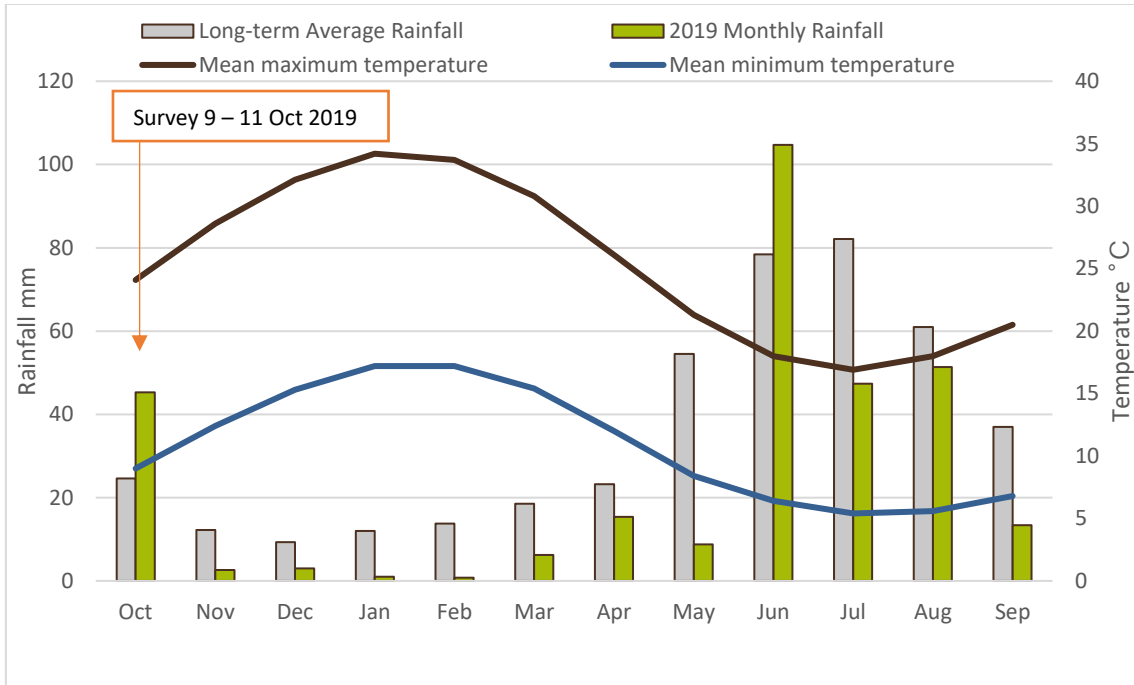
The long-term mean minimum temperature for Northam ranges from 5.4°C (July) to 17.2°C (January and February) (1877 to 2019) and the long-term mean maximum temperature ranges from 16.9°C (July) to 34.2°C (January) (1877 to 2019) (Bureau of Meteorology, 2019). The long-term annual average rainfall is 428.0 millimetres (mm) (1877 to 2019) (Bureau of Meteorology, 2019) (Graph 1). In the three months prior to the survey (July to September 2019), 112.2 mm of rainfall was recorded from the Northam station, which is 67.9 mm below the long-term average of 180.1 mm for the same time period (1877 to 2019) (Bureau of Meteorology, 2019) (Graph 1).

Chidlow weather station is approximately 8.6 km from Survey Area and located within the same rainfall isohyet and recorded 249.9 mm for the same period (July to September 2019) (Bureau of Meteorology, 2019). In addition, Toodyay weather station is 22.5 km from the Survey Area and recorded 140.8 mm (Bureau of Meteorology, 2019). Considering these weather stations are closer to the Survey Area and within the same rainfall isohyet, this rainfall data will be interpreted throughout the report.

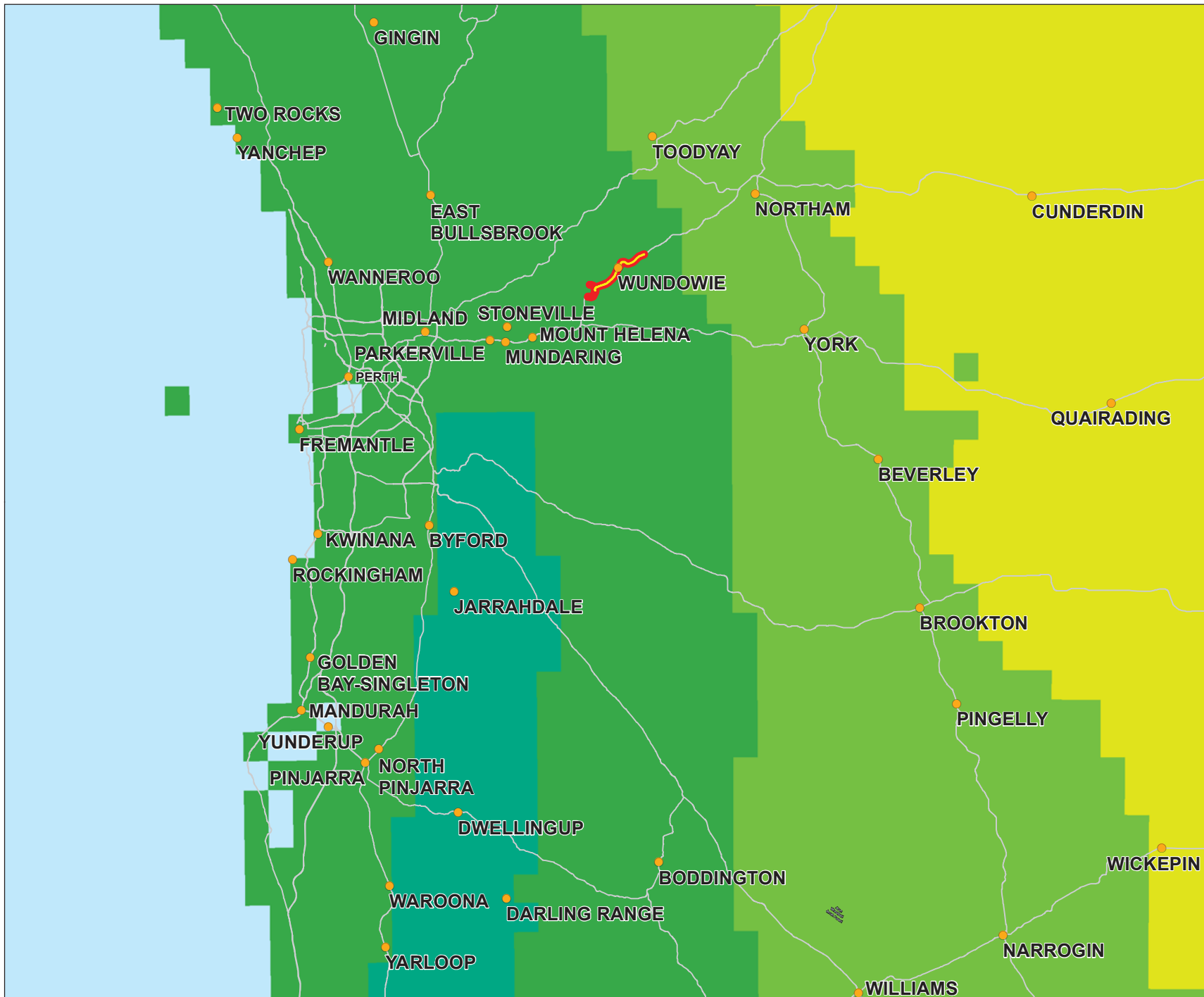
According to BoM, Northam is located within the rainfall climatic zone of 400-600 mm (Bureau of Meteorology, 2019). Figure 2 illustrates the rainfall isohyet climatic data for the Swan Coastal Plain and western Wheatbelt region. The Survey Area is located within the rainfall climatic zone



of 600-1000 mm and towards to eastern range, indicating that the Survey Area is likely to receive rainfall totals in the lower range; however still greater than 600 mm/year (Figure 2).



**Graph 1: Long term and monthly total rainfall, maximum and minimum temperatures for Northam (10111) (Bureau of Meteorology, 2019)**



**Legend**

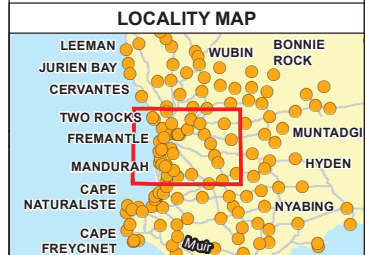
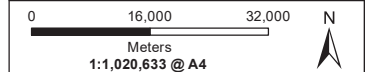
- Survey Area Boundary
- Road Reserve
- State Road

**Annual Average Rainfall (mm)**

- 301 - 400
- 401 - 600
- 601 - 1,000
- 1,001 - 1,500

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	CM	NW	0

**Main Roads WA**  
 Great Eastern Highway, Coates Gully (SLK 55.8 –68.5)  
 Detailed Flora and Vegetation Survey

**Figure 2 Survey Area Showing Annual Rainfall**

### 2.2.2 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (Department of the Environment and Energy, 2016). The Survey Area occurs within the Jarrah Forest bioregion and the Northern Jarrah Forest (JF1) subregion.

The Northern Jarrah Forest subregion incorporates the area east of the Darling Scarp, overlying Archaean granite and metamorphic rocks of an average elevation of 300 m (Williams and Mitchell, 2001). It is capped by an extensive lateritic duricrust, dissected by later drainage and broken by occasional granite hills (Williams and Mitchell, 2001).

The duricrusted plateau of Yilgarn Craton characterised by Jarrah-Marri forest on laterite gravels and, in the eastern part, by woodlands of Wandoo-Marri on clayey soils (Williams and Mitchell, 2001). In areas of Mesozoic sediments, Jarrah forests occur in a mosaic with a variety of species-rich shrublands (Williams and Mitchell, 2001).

### 2.2.3 Soil Landscapes and Land Systems

The soil landscapes and land system mapping of Western Australia describes broad soil and landscape characteristics from regional to local scales, and has been captured at scales ranging from 1:20,000 to 1:250,000 (Department of Agriculture and Food WA, 2012). The Survey Area is located on the Darling Plateau and occurs within two land systems (Figure 3) and are described below:

- **Boyagin System (253By):** Large duricrust remnants surrounded by stripped terrain of rock outcrops and fresh soils in Eastern Darling Range Zone. Gravels have Jarrah-Marri-Parrotbush forest. Loams and duplexes with York and Wandoo. Mallet and Powderbark on scarp. Of the Survey Area, there is 18.08ha of the Boyagin System.
- **Murray Valleys System (255Mv):** Western Darling Range from the Avon Valley to Harvey. Deeply incised valleys with Red loamy earths, shallow duplexes and rock outcrop and Jarrah-marri-wandoo forest and woodland with mixed shrubland (Department of Agriculture and Food WA, 2012). Of the Survey Area, there is 42.27 ha of the Murray Valleys System.

### 2.2.4 Hydrology and Wetlands

The Survey Area continually intersects Coates Gully, a minor watercourse that follows the Great Eastern Highway for the majority of the Survey Area (Figure 4). Coates Gully feeds into numerous minor watercourses surrounding the Survey Area (Department of Water and Environmental Regulation, 2016).

No geomorphic wetlands were identified to intersect the Survey Area (Department of Biodiversity Conservation and Attractions, 2017).

## 2.3 Biological Environment

### 2.3.1 Broad Vegetation Types

Mapping of pre-European broad vegetation within Western Australia was completed on a broad scale (1:1,000,000) by Beard (1976). These vegetation types were later re-assessed by Shepherd et al. (2002) with some larger vegetation units divided into smaller units. Together, this pre-European database contains a total of 819 vegetation types within Western Australia.

Two broad vegetation types are mapped over the Survey Area (Figure 5). These vegetation types areas described below and their representation at a local, regional and state level is shown in Table 1.

- **Bannister 1006:** Woodland southwest; Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*) and Wandoo (*E. wandoo*).
- **East Darling 3003:** Forest: Mainly Jarrah (*Eucalyptus marginata*), and Marri (*Corymbia calophylla*) (Department of Primary Industries and Regional Development, 2018b).

**Table 1: Broad Vegetation Types within the State, Regional and Local Representation (Department of Biodiversity Conservation and Attractions, 2019a)**

Vegetation Type	Pre-European Extent (ha)	Current Extent (ha)	Remaining (%)	Current Extent Managed in DBCA Lands (%)
<b>Representation across Western Australia</b>				
Bannister 1006	44,908.30	21,769.53	48.48	22.97
East Darling 3003	66,451.58	39,061.78	58.78	27.21
<b>Representation across the Jarrah Forest Bioregion</b>				
Bannister 1006	44,908.30	21,769.53	48.48	22.97
East Darling 3003	66,451.58	39,061.78	58.78	27.21
<b>Representation across the Northern Jarrah Forest subregion</b>				
Bannister 1006	44,908.30	21,769.53	48.48	22.97
East Darling 3003	66,451.58	39,061.78	58.78	27.21

Mapping by Heddle, Loneragan and Havel (1980) used landform-soil units determined by Churchward and McArthur (1978) and has identified four vegetation complexes as occurring across the entire the Survey Area. The delineation of vegetation complexes is based on the concept of a series of plant communities forming regularly repeating complexes associated with a soil unit. The four vegetation complexes identified across the Survey Area are as follows:

- **Murray and Bindoon Complex in Low to Medium Rainfall:** open forest to woodland
- **Pindalup and Yarragil Complex in Low to Medium Rainfall:** open forest and woodland
- **Yalanbee Complex in Low Rainfall:** woodlands and less consistently open forest
- **Coolakin Complex in Low Rainfall:** woodland.

### 2.3.2 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared to prevent degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs) or significant wetlands. Exemptions contained in the Environmental Protection (Clearing of Native vegetation) Regulations 2004 for low impact land clearing do not apply in ESAs and a clearing permit is required.

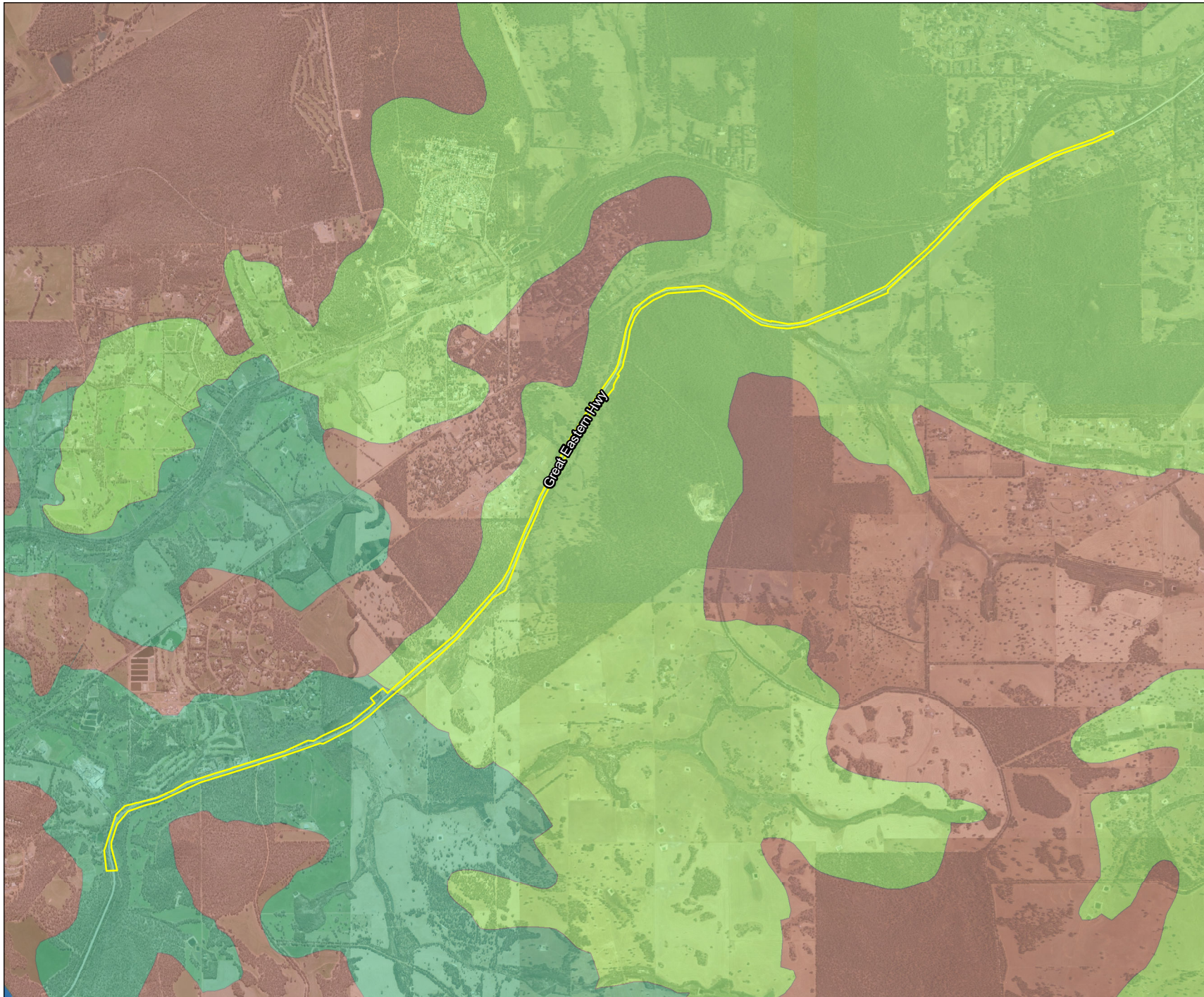
The Survey Area is not identified within any mapped ESAs (Department of Water and Environmental Regulation, 2018).

### 2.3.3 Conservation Areas

The Survey Area intersects a very small portion of Kwolyinine Nature Reserve (R14276) which is vested under the Conservation Commission of Western Australia. Two additional conservation areas are located directly adjacent to the Survey Area. These Nature Reserves are described below and shown in Figure 6.

- Keaginine Nature Reserve Park (R14278) is vested under the Conservation Commission of Western Australia
- Woondowing Nature Reserve (R14275) is vested under the Conservation Commission of Western Australia.

The southern section of the Survey Area intersects the Perth Regional Ecological Linkage (Perth Biodiversity Project, 2008) (Figure 6).



## Legend

Survey Area Boundary

### Soil and Land Systems

253By: Large duricrust remnants surrounded by stripped terrain of rock outcrops and fresh soils in Eastern Darling Range Zone. Gravels have Jarrah-Marri-Parrotbush forest. Loams and duplexes with Yo\*

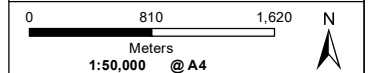
253Wn: Intact undulating lateritic terrain with minor rock outcrops in the north eastern Darling Range. "Buckshot" gravels, duricrust and some deep sands vegetated by Jarrah forest.

255Dp: Lateritic plateau. Duplex sandy gravels, loamy gravels and wet soils. Jarrah-marri-wandoo forest and woodland.

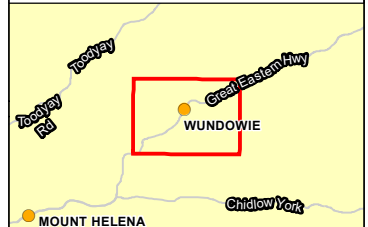
255Mv: Western Darling Range from the Avon Valley to Harvey. Deeply incised valleys with Red loamy earths, shallow duplexes and rock outcrop and Jarrah-marri-wandoo forest and woodland with mixed sh\*

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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 - OTHER DATA SOURCED LANDGATE 2018  
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### LOCALITY MAP



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3564	18/03/2020

HORIZONTAL DATUM AND PROJECTION  
 GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	NW	NW	3

**Main Roads WA**  
**Great Eastern Highway, Coates Gully (SLK 55.8 –68.5)**  
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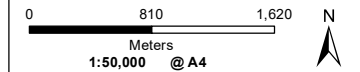
**Figure 3**  
**Soil and Land Systems**



- Legend**
- Survey Area Boundary
  - Hydrography**
  - Watercourse - minor
  - Watercourse - indefinite
  - Drain - minor
  - Natural Pool
  - Lake - artificial
  - Water Reservoir
  - Marsh Area

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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**LOCALITY MAP**



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CREATED LF	CHECKED NM	APPROVED NW	REVISION 3

**Main Roads WA**  
**Great Eastern Highway, Coates Gully (SLK 55.8 –68.5)**  
**Detailed Flora and Vegetation Survey**

**Figure 4**  
**Hydrology**

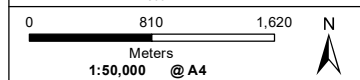


**Legend**

- Survey Area Boundary
- Pre-European Vegetation**
- BANNISTER\_1006
- BANNISTER\_4
- EAST DARLING\_3003

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
 - LOCALITY MAP SOURCED LANDGATE 2017  
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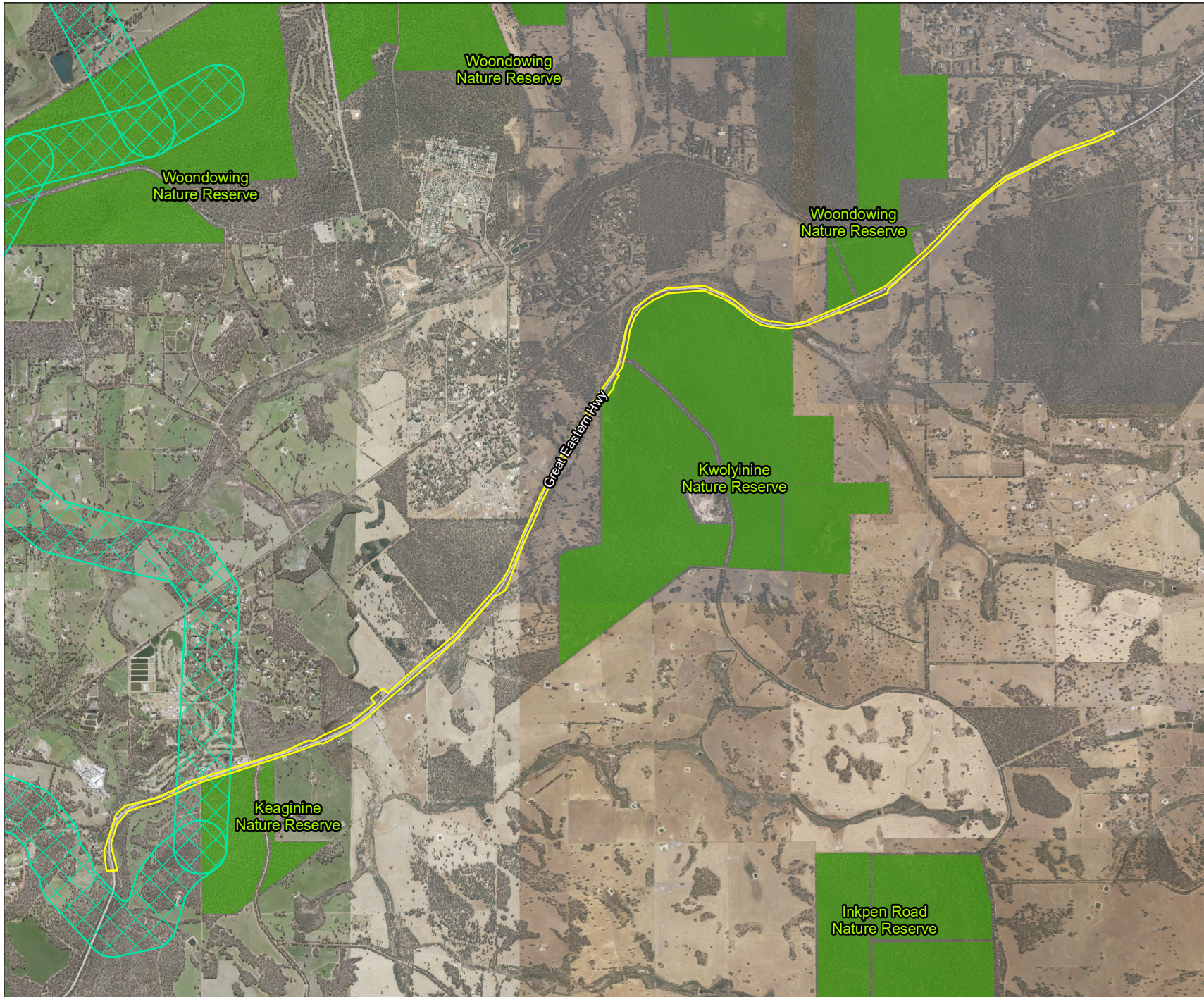
**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

<b>CREATED</b> LF	<b>CHECKED</b> NW	<b>APPROVED</b> NW	<b>REVISION</b> 3
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**Main Roads WA**  
**Great Eastern Highway, Coates Gully (SLK 55.8 –68.5)**  
**Detailed Flora and Vegetation Survey**

**Figure 5**  
**Broad Vegetation Types**

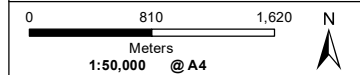




- Legend**
- Survey Area Boundary
  - Perth Regional Ecological Linkages
  - DBCA Managed Lands and Waters

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
 - LOCALITY MAP SOURCED LANDGATE 2017  
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**LOCALITY MAP**



PROJECT ID	DATE
3564	18/03/2020

HORIZONTAL DATUM AND PROJECTION  
 GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	NW	NW	3

**Main Roads WA**  
**Great Eastern Highway, Coates Gully (SLK 55.8 –68.5)**  
**Detailed Flora and Vegetation Survey**

**Figure 6**  
**Conservation Areas**

## 3 Methods

### 3.1 Requirements for Flora Surveys

This survey has been carried out as per the Environmental Protection Authority (EPA) requirements for environmental surveying and reporting of flora and vegetation surveys in Western Australia where relevant, and as documented in:

#### Western Australia

- Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (Environmental Protection Authority, 2016).

#### Federal

- Matters of National Environmental Significance Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation (EPBC) Act 1999 (Department of the Environment, 2013).

### 3.2 Desktop Assessment

#### 3.2.1 Database Searches

Database searches were undertaken to identify potential flora of conservation significance and Ecological Communities within or surrounding (15 km) the Survey Area (herein known as the Study Area) (Figure 7 and Figure 8). Database search particulars are outlined in Table 2. The search buffer from the centre of the Survey Area was 15 km.

The diagnostic characteristics of the Priority Ecological Communities (PEC) and Threatened Ecological Communities (TEC) within the Jarrah Forest bioregion were examined to determine if any corresponded with the vegetation assemblages within the Survey Area. In addition, the EPBC Protected Matters Search Tool (PMST) was used to identify the potential for Matters of National Environmental Significance (MNES) to occur within or surrounding the Survey Area (Department of the Environment and Energy, 2019).

**Table 2: Database Searches of the Survey Area**

Database Name	Date Received	Search Target	Search Area
Threatened and Priority Ecological Communities database	Provided	Listed TECs and PECs	15 km search buffer of the Survey Area
DBCA Threatened and Priority Flora Species List (TPFL list) (Department of Biodiversity Conservation and Attractions, 2019e)	Provided	Threatened Priority Flora	15 km search buffer of the Survey Area
Western Australian Herbarium flora (Department of Biodiversity Conservation and Attractions, 2019f)	Provided		15 km search buffer of the Survey Area
NatureMap (Department of Biodiversity Conservation and Attractions, 2019c)	3 October & 2 December 2019		15 km search buffer of the Survey Area

Database Name	Date Received	Search Target	Search Area
Protected Matters Search Tool (Department of the Environment and Energy, 2019)	29 January 2020		15 km search buffer of the Survey Area

### 3.2.2 Likelihood of Occurrence

Conservation significant flora species identified from the desktop assessment were further examined to determine a likelihood of occurrence both prior and post field survey. The assessment was completed based on the likelihood of occurrence criteria presented in Table 3. Species either recorded within the Survey Area or considered as having a high or medium likelihood of occurrence will be discussed in detail. Species classified as having a low likelihood of occurrence based on the criteria will not be discussed unless a justification for this classification is required.

**Table 3: Likelihood of Occurrence Criteria**

Likelihood	Flora
<b>Recorded</b>	Flora species recorded within the Survey Area during the field survey.
<b>High</b>	Previously recorded within Survey Area or within 5 km and has suitable habitat within the Survey Area
<b>Medium</b>	Previously recorded between 5 and 10 km of the Survey Area and has suitable habitat within the Survey Area
<b>Low</b>	No suitable habitat is present in the Survey Area and/or records are greater than 10 km

### 3.2.3 Literature Review

A literature review was undertaken to identify any previously completed surveys within the general region. This includes reviewing all publicly available reports to assist with understanding any key biological findings nearby.

## 3.3 Flora and Vegetation

### 3.3.1 Field Survey

A detailed single season flora and vegetation survey was undertaken by Principal Botanist Narelle Whittington (FB62000177 and TFL70 - 1920) and Ecologist Colleen McDonald (Flora Licence FB 2000148/ TP69-1920) from the 9<sup>th</sup> to the 11<sup>th</sup> of October 2019. The field survey included an assessment of seven quadrats, five relevés, mapping notes, vegetation condition notes, opportunistic flora collections, observations and a targeted Priority flora search. Figure 9 illustrates overall Survey Effort from handheld GPS track logs for the duration of the survey.

Each quadrat was accurately measured using measuring tapes, and the northwest corner was demarcated with a steel fence dropper. At the NW corner of each quadrat, the location was recorded using a handheld Garmin GPS unit, and Fulcrum mobile data collection device with a photograph.

At each quadrat, the following data was recorded:

- Site code – a unique identifier allocated to each quadrat
- Date and recorder – a record of the date of quadrat sample and a list of the personnel involved in sampling the quadrat
- Location – GPS coordinates (MGA94) measured from the north west corner of the quadrat
- Dimensions – the size and shape of the quadrat
- Landform and soil description – a description of the quadrat habitat
- Additional site descriptors – location information that might be useful in vegetation classification including, slope, aspect, litter cover, bare ground cover and fire history
- Species list – a comprehensive vascular flora species list
- Foliar cover – the estimated total percentage foliar cover for each species recorded
- Height – the average height (in meters) of each species recorded
- Vegetation description – a description of the vegetation according to the National Vegetation Information System (NVIS), Level 5. According to this level, vegetation is classified to ‘association’, where the dominant growth form, height, cover and species (three species) for the three traditional strata (upper, mid and ground) are described (Department of the Environment and Energy, 2017)
- Vegetation condition – assessed according to the vegetation condition scale (Environmental Protection Authority, 2016) as adapted from Keighery (1994)
- Photographs – a photograph from the north west corner looking toward the south east corner was taken.

Relevés were used in areas that were in an altered state, absence of intact native vegetation, the vegetation type was not of an adequate size, was low in diversity or for when general additional information was required for mapping purposes.

At each relevé, the following data was recorded:

- Site descriptors – location information that might be useful in vegetation classification including, slope, aspect, soils, litter cover, bare ground cover and fire history
- Dominant species list – a vascular flora species list of the dominant species present, including weeds
- Height – the average height of each species recorded
- Foliar cover – the estimated total percentage foliar cover for each species recorded
- Vegetation Condition - assessed according to the vegetation condition scale ((Environmental Protection Authority, 2016) as adapted from Keighery (1994)
- Photographs – a photograph was taken.

### 3.3.2 Flora of Conservation Significance

The Survey Area was traversed on foot and opportunistic collections were made to identify flora of conservation significance which were listed in the Desktop Assessment.

Specimens were collected for identification and lodgement at the Western Australian Herbarium (WAH).

### 3.3.3 Taxonomy and Nomenclature

Where field identification of plant taxa was not possible, specimens were collected systematically for later identification using resources of the WAH. Taxonomy was completed by experienced Taxonomist Dr Udani Sirisena at the WA herbarium.

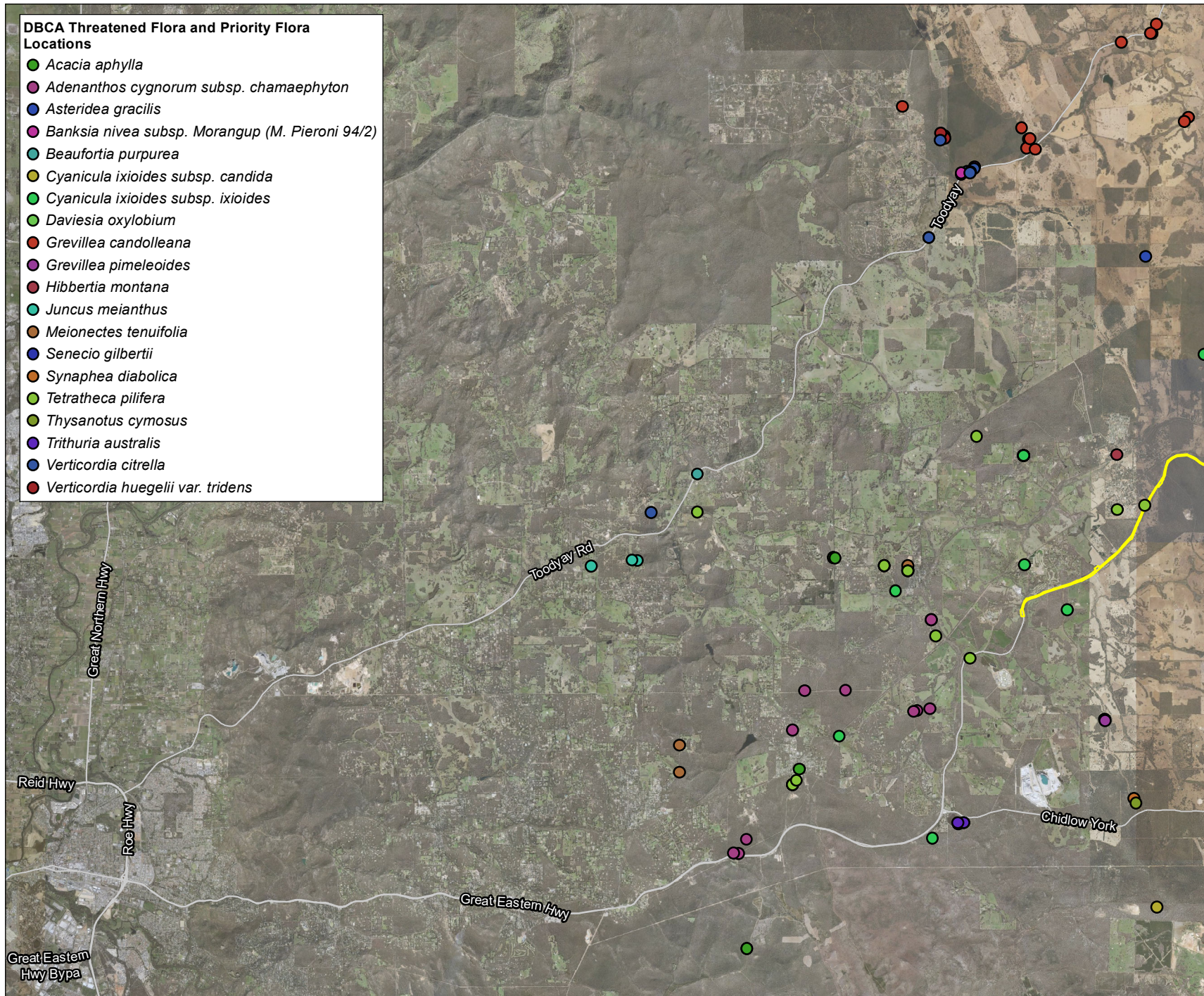
The finalised species list was checked against FloraBase (Department of Biodiversity Conservation and Attractions, 2019b) to determine the species' conservation status and known distribution. Introduced species were assessed to determine if they were a Declared Plant according to the BAM Act or a WoNS (Department of Environment and Energy, 2018; Department of Primary Industries and Regional Development, 2018a).

**DBCA Threatened Flora and Priority Flora Locations**

- *Acacia aphylla*
- *Adenanthos cygnorum subsp. chamaephyton*
- *Asteridea gracilis*
- *Banksia nivea subsp. Morangup (M. Pieroni 94/2)*
- *Beaufortia purpurea*
- *Cyanicula ixiooides subsp. candida*
- *Cyanicula ixiooides subsp. ixiooides*
- *Daviesia oxylobium*
- *Grevillea candolleana*
- *Grevillea pimeleoides*
- *Hibbertia montana*
- *Juncus meianthus*
- *Meionectes tenuifolia*
- *Senecio gilbertii*
- *Synaphea diabolica*
- *Tetratheca pilifera*
- *Thysanotus cymosus*
- *Trithuria australis*
- *Verticordia citrella*
- *Verticordia huegelii var. tridens*

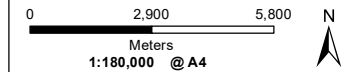
**Legend**

Survey Area Boundary

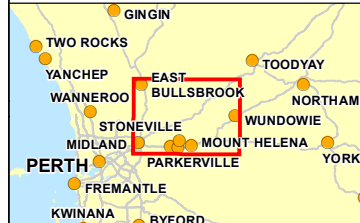


- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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**LOCALITY MAP**



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HORIZONTAL DATUM AND PROJECTION  
 GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	NW	NW	3

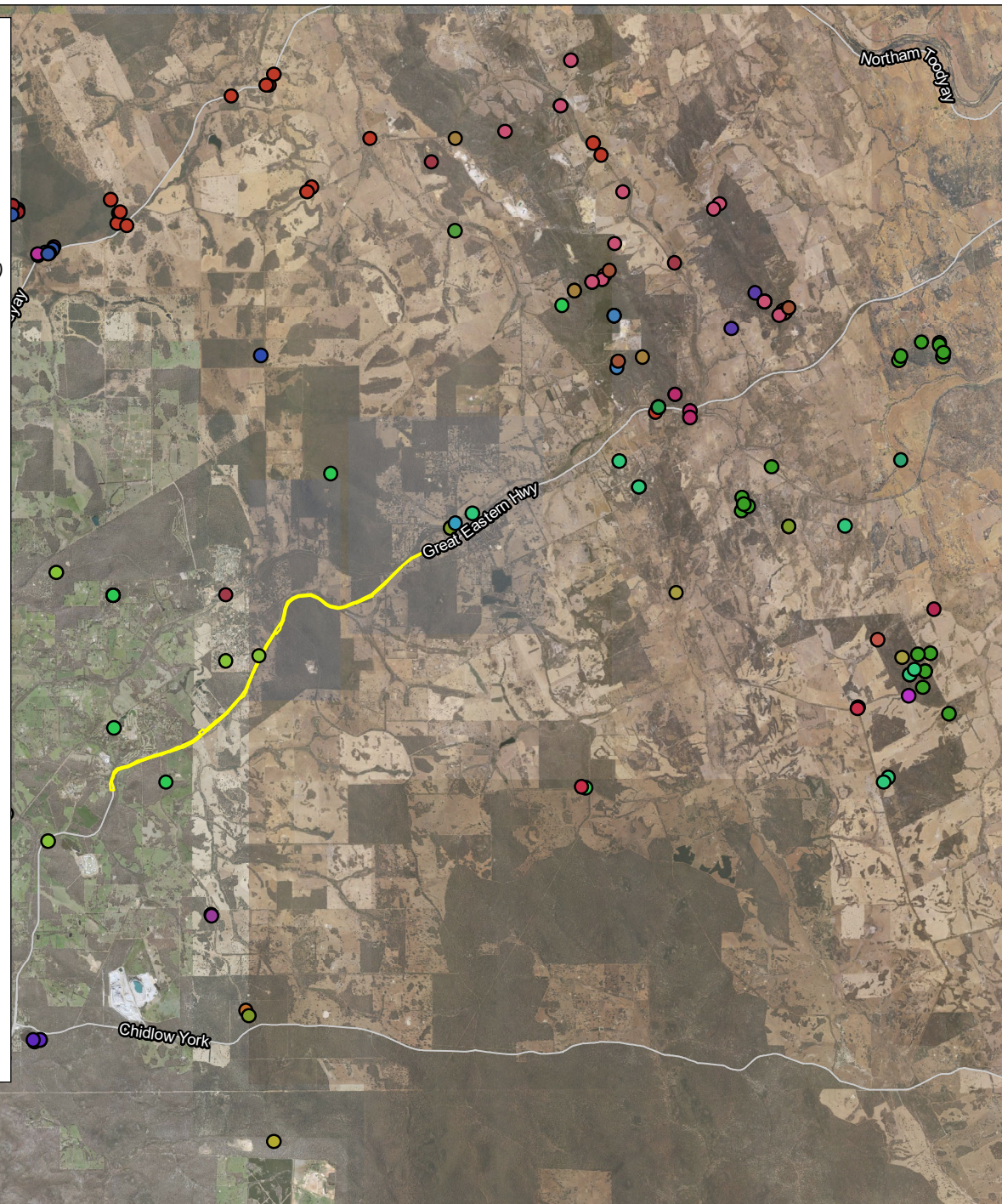
**Main Roads WA**  
 Great Eastern Highway, Coates Gully (SLK 55.8 –68.5)

**Detailed Flora and Vegetation Survey**

**Figure 7a**  
 DBCA Threatened Flora and Priority Flora Locations - West

**DBCA Threatened Flora and Priority Flora Locations**

- *Acacia aphylla*
- *Acacia campylophylla*
- *Adenanthos cygnorum* subsp. *chamaephyton*
- *Amperea micrantha*
- *Anigozanthos humilis* subsp. *chrysanthus*
- *Asteridea gracilis*
- *Asterolasia grandiflora*
- *Banksia nivea* subsp. *Morangup* (M. Pieroni 94/2)
- *Beaufortia purpurea*
- *Caladenia integra*
- *Chordifex chaunocoleus*
- *Cyanicula ixiooides* subsp. *candida*
- *Cyanicula ixiooides* subsp. *ixioides*
- *Daviesia nudiflora* subsp. *drummondii*
- *Daviesia oxylobium*
- *Drosera albonotata*
- *Eremaea blackwelliana*
- *Eucalyptus loxophleba* x *wandoo*
- *Grevillea candolleana*
- *Grevillea pimeleoides*
- *Hibbertia montana*
- *Juncus meianthus*
- *Lasiopetalum trichanthera*
- *Meionectes tenuifolia*
- *Senecio gilbertii*
- *Sowerbaea multicaulis*
- *Stylidium asteroideum*
- *Stylidium exappendiculatum*
- *Stylidium periscelianthum*
- *Stylidium striatum*
- *Synaphea diabolica*
- *Tetratheca pilifera*
- *Thysanotus cymosus*
- *Trithuria australis*
- *Verticordia citrella*
- *Verticordia huegelii* var. *tridentis*
- *Verticordia serrata* var. *linearis*

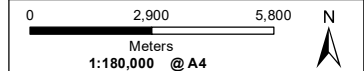


**Legend**

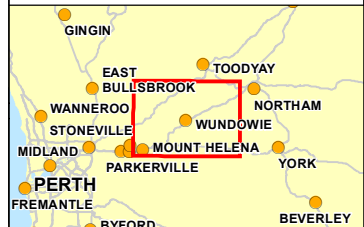
Survey Area Boundary

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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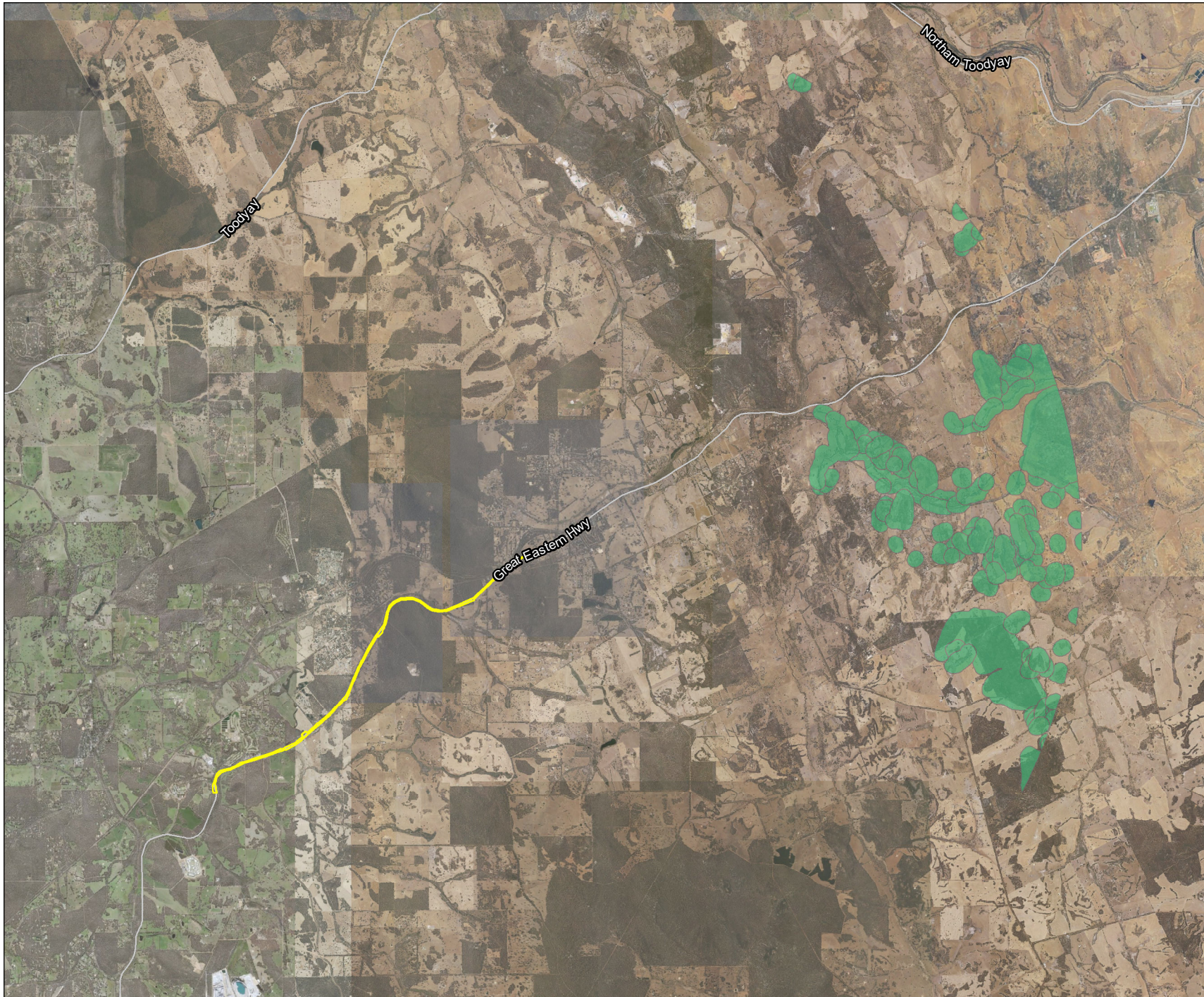
**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	NW	NW	3

**Main Roads WA**  
 Great Eastern Highway, Coates Gully (SLK 55.8 –68.5)

**Detailed Flora and Vegetation Survey**

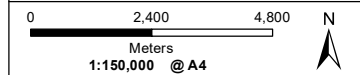
**Figure 7b**  
**DBCA Threatened Flora and Priority Flora Locations - East**



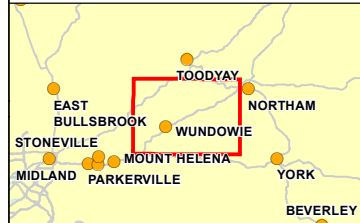
- Legend**
- Survey Area Boundary
  - Eucalypt woodlands of the Western Australian Wheatbelt

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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**HORIZONTAL DATUM AND PROJECTION**  
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<b>CREATED</b> LF	<b>CHECKED</b> NW	<b>APPROVED</b> NW	<b>REVISION</b> 3
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**Main Roads WA**  
 Great Eastern Highway, Coates Gully (SLK 55.8 –68.5)  
 Detailed Flora and Vegetation Survey

**Figure 8**  
**DBCA Threatened Priority Ecological Communities**

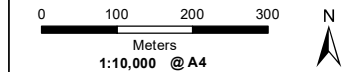




- Legend**
- Survey Area Boundary
  - Road Reserve
- Quadrats and Releve Locations**
- Quadrat Locations
  - Releve Location
  - GPS Tracks

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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 - OTHER DATA SOURCED LANDGATE 2018  
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**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

<b>CREATED</b> LF	<b>CHECKED</b> NW	<b>APPROVED</b> NW	<b>REVISION</b> 3
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**Main Roads WA**  
**Great Eastern Highway, Coates Gully**  
**(SLK 55.8 –68.7)**

**Detailed Flora and Vegetation**  
**Survey**

**Figure 9a**  
**Survey Effort**

441000

442000

6482000

6482000

6481000

6481000

441000

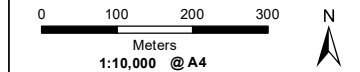
442000



- Legend**
- Survey Area Boundary
  - Road Reserve
- Quadrats and Relve Locations**
- Quadrat Locations
  - ▲ Relve Location
  - GPS Tracks
- Priority Flora**
- *Lechenaultia hortii* (P2)
  - *Tetradlea pilifera* (P2)

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

<b>CREATED</b> LF	<b>CHECKED</b> NW	<b>APPROVED</b> NW	<b>REVISION</b> 3
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**Main Roads WA**  
 Great Eastern Highway, Coates Gully  
 (SLK 55.8 –68.7)

**Detailed Flora and Vegetation Survey**

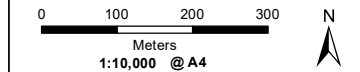
**Figure 9b  
 Survey Effort**



- Legend**
- Survey Area Boundary
  - Road Reserve
- Quadrats and Releve Locations**
- ▲ Releve Location
  - GPS Tracks

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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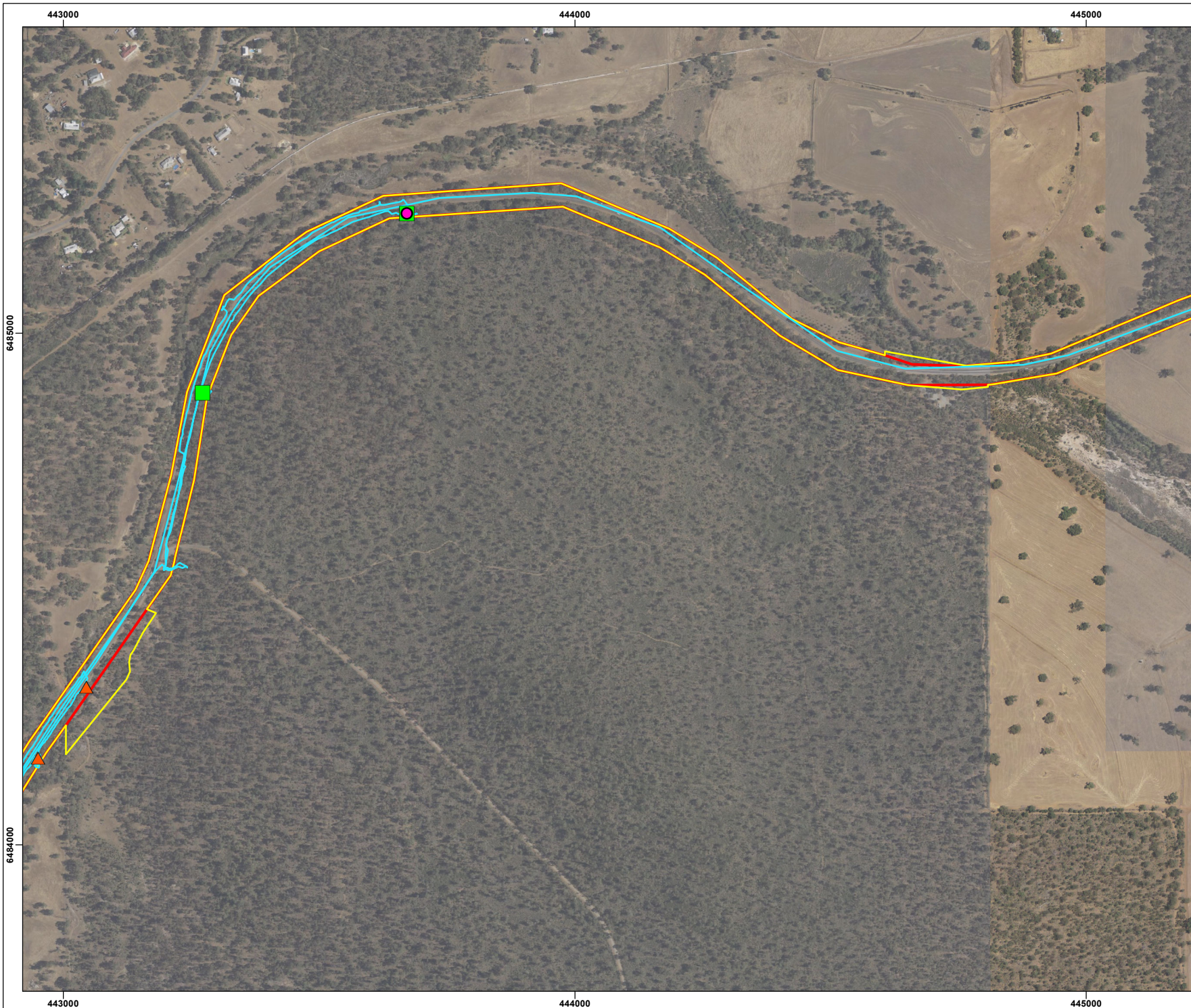
**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

<b>CREATED</b> LF	<b>CHECKED</b> NW	<b>APPROVED</b> NW	<b>REVISION</b> 3
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**Main Roads WA**  
**Great Eastern Highway, Coates Gully**  
**(SLK 55.8 –68.7)**

**Detailed Flora and Vegetation**  
**Survey**

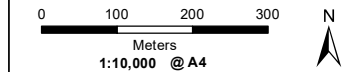
**Figure 9c**  
**Survey Effort**



- Legend**
- Survey Area Boundary
  - Road Reserve
- Quadrats and Releve Locations**
- Quadrat Locations
  - Releve Location
  - GPS Tracks
- Priority Flora**
- Lechenaultia hortii* (P2)

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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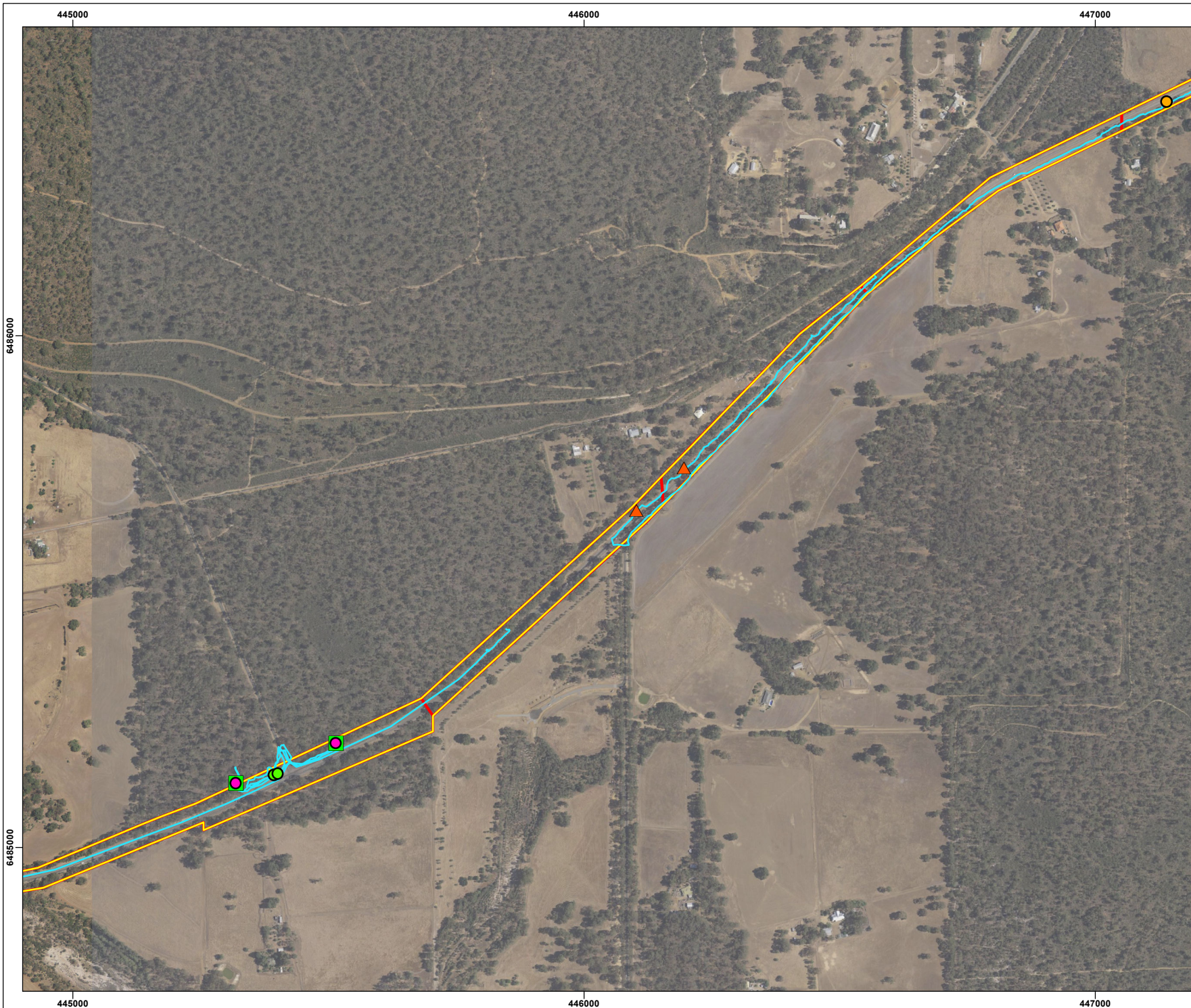


PROJECT ID 3564		DATE 18/03/2020	
HORIZONTAL DATUM AND PROJECTION GDA 1994 MGA Zone 50			
CREATED LF	CHECKED NW	APPROVED NW	REVISION 3

**Main Roads WA**  
 Great Eastern Highway, Coates Gully  
 (SLK 55.8 –68.7)

**Detailed Flora and Vegetation Survey**

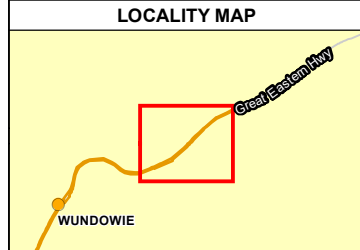
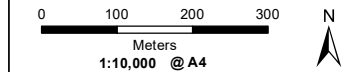
**Figure 9d  
 Survey Effort**



- Legend**
- Survey Area Boundary
  - Road Reserve
- Quadrats and Relieve Locations**
- Quadrat Locations
  - ▲ Relieve Location
  - GPS Tracks
- Priority Flora**
- *Grevillea olivacea* (P4)
  - *Lechenaultia hortii* (P2)
  - *Tetratheca pilifera* (P2)

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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 - OTHER DATA SOURCED LANDGATE 2018  
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**Main Roads WA**  
 Great Eastern Highway, Coates Gully  
 (SLK 55.8 –68.7)

**Detailed Flora and Vegetation Survey**

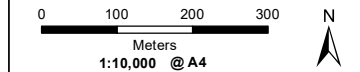
**Figure 9e**  
 Survey Effort



- Legend**
- Survey Area Boundary
  - Road Reserve
- Quadrats and Relieve Locations**
- ▲ Relieve Location
  - GPS Tracks
- Priority Flora**
- Grevillea olivacea* (P4)

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<b>PROJECT ID</b>	3564	<b>DATE</b>	18/03/2020
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**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	NW	NW	3

**Main Roads WA**  
 Great Eastern Highway, Coates Gully  
 (SLK 55.8 –68.7)

**Detailed Flora and Vegetation Survey**

**Figure 9f**  
**Survey Effort**

## 4 Results

### 4.1 Limitations

Limitations and constraints of the flora and vegetation survey are detailed below in Table 4.

**Table 4: Limitations and Constraints associated with the Survey**

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
<b>Availability of Data</b>	Not a limitation	All data required to complete the scope of works including regional and local contextual information was available
<b>Access and Survey Intensity</b>	Not a limitation	Majority of the Survey Area was able to be accessed by foot. Directions from Main Roads instructed 360 Environmental not traverse over property boundaries when undertaking the field survey. However, these areas were able to be surveyed from the property boundaries. Nature reserves were surveyed without establishing quadrats or disturbing flora.
<b>Experience</b>	Not a limitation	The flora and vegetation survey was undertaken by Principal Botanist Narelle Whittington and Ecologist Colleen McDonald. Narelle has over 20 years' experience conducting surveys of similar scope throughout Western Australia. Colleen has worked as an environmental consultant for two years and has completed several flora and vegetation surveys state-wide.
<b>Timing, weather, season</b>	Low Limitation	The recommended primary survey period for the region as per the EPA Technical Guidance is Spring (September – November) in which this survey was undertaken.  Rainfall is considered a slight limitation as the Northam weather station recorded 300.0 mm of rainfall in the 12 months prior to the survey, which is 128 mm below to the long-term average of 428.0 mm. In the three months prior to the survey (July 2019 to September 2019), 112.2 mm of rainfall was recorded, which is 67.9 mm below the long-term average of 180.1 mm for the same time period.  249.9 mm of rainfall was received at Chidlow (8.6 km from survey area and located within the same rainfall isohyet as the survey area) and 140.8 mm of rainfall was recorded at Toodyay (22.5 km from survey area) between July-September 2019
<b>Life forms sampled</b>	Minor limitation	Of the 161 flora taxa collected, eight (4.9 %) were unable to be identified to species level due to the absence of identifiable features such as fruits and flowers.
<b>Completeness</b>	Not a limitation	The survey was considered complete for a detailed flora and vegetation survey, all vegetation types were surveyed and delineated within the Survey Area.

## 4.2 Literature Review

The following reports were reviewed as part of the Literature Review:

### **Great Eastern Highway SLK 55.8 to SLK68.5 Level 1 flora, Vegetation and *Phytophthora* Dieback Assessment (Terratree Pty Ltd, 2015)**

WPS Parsons Brinckenhoff, on behalf of Main Roads, engaged Terratree Pty Ltd (Terratree) to undertake a Level 1 Flora and Vegetation assessment and *Phytophthora* spp. (Dieback) assessment within an assessment corridor along the Great Eastern Highway between Straight Line Kilometres (SLK's) 55.8 to 68.5. The assessments were to inform and facilitate a proposed section upgrade involving road widening, which will require clearing of native vegetation within the road reserve. The Survey Area is very similar to the Survey Area subject to this report, however, extended much further into the reserves adjacent to the road.

- No TECs or PECs were identified as occurring in the study area
- A total of seven vegetation communities were described and mapped within the study area during the field survey
- A total of 146 vascular flora taxa, including 20 introduced species, were recorded within the study area
- No Threatened (Declared Rare) flora were recorded during the survey. One species of Priority flora was recorded: *Tetratheca pilifera* (Priority 3).

### **Wundowie Flora, Vegetation and Fauna Assessment Report (360 Environmental Pty Ltd, 2014)**

360 Environmental Pty Ltd (360 Environmental) was commissioned by the Water Corporation (WC) in November 2013 to undertake Level 2 flora and vegetation, and Level 1 fauna assessment (including Black Cockatoos) for a new 2.5 ML tank facility and access road (the Survey Area) located in Wundowie, approximately 50 km north east of Perth. The Survey Area was approximately 1.3 ha and approximately 3.22 km from the Coates Gully Survey Area

- A total of 49 botanical taxa (including species, subspecies, varieties and forms) from 41 genera and 24 families were recorded in the Survey Area.
- No Threatened species pursuant to the EPBC Act 1999 (EPBC Act) and/or gazetted as Declared Rare Flora (DRF) pursuant to the WC Act 1950 (WC Act) were recorded during the survey. No Priority species as listed by the DBCA were recorded during the survey.
- Due to the small size of the Survey Area and its uniform habitat only one vegetation association, EmCc was mapped in the Survey Area and was described as:
  - *Eucalyptus marginata* and *Corymbia calophylla* woodland to open forest over *Banksia sessilis*, and *B. squarrosa* subsp. *squarrosa* tall open shrubland over *Xanthorrhoea preissii* and *Macrozamia riedlei* (open) shrubland over *Hibbertia hypericoides*, *Leucopogon capitellatus* and *Hakea lissocarpha* low shrubland over *Lepidosperma leptostachyum* very open sedgeland over *Conostylis setigera* scattered herbs.



- The described vegetation association for the Survey Area did not appear to be analogous with any listed TECs or PECs.

## 4.3 Flora and Vegetation

### 4.3.1 Desktop Assessment

The desktop assessment identified 46 flora species of conservation significance occurring within 15 km of the Survey Area, which included:

- 11 Threatened species
- one Priority 1 species
- seven Priority 2 species
- 14 Priority 3 species
- 13 Priority 4 species.

A comprehensive list of all conservation significant records identified in the Desktop Assessment from each database is provided in Appendix A and the DBCA record locations are mapped in Figure 7.

The desktop assessment identified one PEC listed by the State occurring within 15 km of the Survey Area (Figure 8) (Department of Biodiversity Conservation and Attractions, 2019d; Department of the Environment and Energy, 2019). The Eucalypt Woodlands of the Western Australian Wheatbelt is listed as a Priority 3 under the State legislation and is listed as a Critically Endangered TEC under the EPBC Act.

### 4.3.2 Likelihood of Occurrence

The conservation significant species identified in the Desktop Assessment were reviewed for their likelihood of occurrence within the Survey Area based on the criteria outlined in Table 3. This was done prior to the field work being undertaken and again following the completion of the field work. The post field survey identified 46 species in the desktop assessment, with one species being recorded within the Survey Area. Two additional conservation significant species were also recorded within the Survey Area; however were not identified by DBCA database search results. The locations of the additional two species were included in Figure 10.

The remaining species are considered to have a low likelihood of occurrence due to the habitat types identified within the Survey Area, the distance of known occurrences of the species and also the targeted conservation significant search that was undertaken. The likelihood assessment is displayed in Table 5.

One priority species (*Tetratheca pilifera* P3) which was identified in the desktop assessment as having a high likelihood of occurrence was recorded within the Survey Area.

During the survey *Grevillea olivacea* was recorded, this species is currently listed as a Priority 4. This species was identified on the road verge of a private property and is likely to be a planted species and is therefore not considered to be a range extension.

**Table 5: Assessment of the Likelihood of Occurrence of DRF and Priority Flora (as per DBCA and EPBC Database Searches) in the Survey Area**

Closest record to Survey Area based on DBCA 2019. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 10 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 10 km from the Survey Area. CR = Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EPBC Act, VU = Listed as Vulnerable under the EPBC Act, T = Threatened under the BC Act, P1 = Listed by DBCA Priority 1, P2 = Listed by DBCA Priority 2, P3 = Listed by DBCA Priority 3, P4 = Listed by DBCA Priority 4, X = Listed by DBCA as Extinct.

Species	Conservation Status			Source		Distance to Nearest Record (km)	Flowering Period	Preferred Habitat	Habitat within the Survey Area	Likelihood of Occurrence pre-survey	Likelihood of Occurrence post survey
	DBCA	EPBC	NatureMap	PMST	DBCA						
<i>Caladenia huegelii</i>	T	EN		X		>20	Sep to Oct	Grey or brown sand, Clay loam.	No	Low	Low
<i>Diploaena andrewsii</i>	T	EN		X		>50	Jul to Oct	Loam, clay. Granite outcrops & hillsides.	No	Low	Low
<i>Diuris purdiei</i>	T	EN		X		>30	Sep to Oct	Grey-black sand, moist. Winter-wet swamps.	No	Low	Low
<i>Eucalyptus recta</i>	T	EN		X		>100	Oct to Jan	Sandy laterite	Yes	Low	Low
<i>Thelymitra dedmaniarum</i>	T	EN		X		>20	Nov to Dec or Jan	Granite	No	Low	Low
<i>Thelymitra stellata</i>	T	EN		X		>20	Oct to Nov	Sand, gravel, lateritic loam.	Yes	Low	Low
<i>Verticordia fimbriolepis</i> subsp. <i>fimbriolepis</i>	T	EN		X		>100	Oct to Dec or Jan	Gravelly sandy or clayey soils. Flats, road verges.	Yes	Low	Low
<i>Acacia aphylla</i>	T	VU	X		X	5-10	Aug to Oct	Sand, loam, clay loam. Granite outcrops, hills.	Yes	Medium	Low
<i>Anthoecis gracilis</i>	T	VU		X		>25	Sep to Oct	Sandy or loamy soils. Granite outcrops.	No	Low	Low
<i>Diuris micrantha</i>	T	VU		X		>50	Sep to Oct	Brown loamy clay. Winter-wet swamps, in shallow water.	Yes	Low	Low
<i>Eleocharis keigheryi</i>	T	VU		X		>30	Aug to Nov	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	Yes	Low	Low
<i>Senecio gilbertii</i>	P1	-	X		X	<5	Sep to Nov	Peaty sand. Swamps, slopes.	Yes	High	Low
<i>Amperea micrantha</i>	P2	-			X	>10	Oct to Nov	Sandy soils.	Yes	Low	Low
<i>Banksia nivea</i> subsp. <i>Morangup</i>	P2	-			X	>10	Apr	Dry-wet laterite with loam-clay-gravel.	Yes	Low	Low
<i>Cyanicula ixioides</i> subsp. <i>candida</i>	P2	-			X	>10	Aug to Oct	Sand, laterite, gravel.	Yes	Low	Low
<i>Drosera albonotata</i>	P2	-	X		X	5-10	Sep to Oct	Midslope. Rocky, grey-brown lateritic clay loam.	Yes	Medium	Low
<i>Grevillea candolleana</i>	P2	-			X	5-10	Aug to Sep	Laterite, lateritic loam. Hillsides.	Yes	Medium	Low
<i>Lasipetalum trichanthera</i>	P2	-			X	5-10	Oct to Feb	White/grey gritty quartzite sand.	No	Low	Low
<i>Verticordia citrella</i>	P2	-			X	>10	Oct to Nov	Gravelly loam or sand. Low-lying damp areas, swamps.	Yes	Low	Low
<i>Acacia campylophylla</i>	P3	-			X	5-10	Jul to Aug	Lateritic gravelly soils.	Yes	Medium	Low
<i>Adenanthos cygnorum</i> subsp. <i>chamaephyton</i>	P3	-	X		X	<5	Jul or Sep to Dec or Jan	Grey sand, lateritic gravel.	Yes	High	Low
<i>Asteridea gracilis</i>	P3	-	X		X	5-10	Sep to Dec	Sand, clay, gravelly soils.	Yes	Medium	Low
<i>Beaufortia purpurea</i>	P3	-			X	>10	Oct to Feb	Lateritic or granitic soils. Rocky slopes.	Yes	Low	Low
<i>Daviesia nudiflora</i> subsp. <i>drummondii</i>	P3	-			X	>10	Jul to Aug	White or grey sand. Undulating low rises.	Yes	Low	Low
<i>Juncus meianthus</i>	P3	-			X	>10	Nov to Jan	Black sand, sandy clay. Creeks, seepage areas.	No	Low	Low
<i>Meionectes tenuifolia</i>	P3	-	X		X	<5	Sep to Dec	Seasonally wet poorly drained flat. Grey sand.	Yes	High	Low
<i>Stylidium asteroideum</i>	P3	-			X	5-10	Sep to Oct	Wandoo open woodland, Winter-wet flat; brown loam, granite	Yes	Medium	Low
<i>Stylidium exappendiculatum</i>	P3	-			X	>10	Sep to Oct	Flat plain, seasonally damp area. Loamy clay soil.	Yes	Low	Low
<i>Synaphea diabolica</i>	P3	-	X			>15	Aug to Oct	Dry, yellow-brown laterite soil with laterite gravel. In undulating areas.	Yes	Low	Low
<i>Tetraloche pilifera</i>	P3	-	X		X	<5	Aug to Oct	Gravelly soils.	Yes	Recorded	Recorded
<i>Thysanotus cymosus</i>	P3	-	X		X	<5	Sep to Oct	Clay, granitic or lateritic sand.	Yes	High	Low
<i>Verticordia huegelii</i> var. <i>tridens</i>	P3	-			X	>10	Sep to Nov	Sandy or gravelly loam. Winter-wet areas, low hills.	Yes	Low	Low
<i>Verticordia serrata</i> var. <i>linearis</i>	P3	-	X	X	X	5-10	Sep to Oct	White sand, gravel. Open woodland.	No	Low	Low
<i>Anigozanthos humilis</i> subsp. <i>chrysanthus</i>	P4	-			X	5-10	Jul to Oct	Grey or yellow sand.	No	Low	Low
<i>Asterolasia grandiflora</i>	P4	-	X		X	<5	Jul to Oct	Lateritic soils, clay over granite. Breakaways, hills.	No	High	Low
<i>Caladenia integra</i>	P4	-			X	5-10	Sep to Oct	Clayey loam. Granite outcrops, rocky slopes.	No	Low	Low
<i>Chordiflex chaunocoleus</i>	P4	-			X	5-10	Sep	Grey, siliceous or peaty sand, well to poorly drained. Drainage lines, depressions.	Yes	Medium	Low
<i>Cyanicula ixioides</i> subsp. <i>ixioides</i>	P4	-	X		X	<5	Aug to Oct	Laterite, gravel.	Yes	High	Low
<i>Daviesia oxylobium</i>	P4	-	X		X	<5	Jul to Aug	Sandy lateritic soils. Undulating plains.	Yes	High	Low
<i>Eremaea blackwelliana</i>	P4	-			X	5-10	Sep to Nov	White sand. Sandy depressions, gentle hillside.	No	Low	Low
<i>Eucalyptus loxophleba</i> x <i>wandoo</i>	P4	-			X	5-10	Aug to Nov	Sandy clay or loam.	Yes	Medium	Low
<i>Grevillea pimeleoides</i>	P4	-	X		X	<5	May to Nov	Gravelly soils over granite. Rocky hillsides.	Yes	High	Low
<i>Hibbertia montana</i>	P4	-	X		X	<5	Jul to Oct	Loam over granite, lateritic soils, gravel. Granite rocks, lateritic ridges & boulders, hills.	Yes	High	Low
<i>Sowerbaea multicaulis</i>	P4	-			X	5-10	Aug to Apr	Flat margin of drainage line. Brown clay loam.	Yes	Medium	Low
<i>Stylidium striatum</i>	P4	-	X		X	<5	Oct to Nov	Brown clay loam over laterite. Hillslopes. Jarrah/Marri forest, Wandoo woodland.	Yes	High	Low
<i>Trithuria australis</i>	P4	-			X	5-10	Oct to Dec	Edge of wetland, grey clay.	Yes	Medium	Low

#### 4.3.3 Flora

The survey recorded a total of 161 taxa from 119 genera across 45 families. The most dominant families were Fabaceae (25 species), Poaceae (12 species) and Proteaceae (10 species) and the most dominant genera was *Acacia* (nine species). A full species inventory is detailed in Appendix B.

A specimen was collected for all species that could not be confidently identified in the field. A portion of flora, representing 11 taxa (6.8%), were unable to be identified confidently to species level. This was mainly due to the specimens being sterile with no flowering material or fruit present. Two species, *Lepidosperma* aff. *apricola* and *Lepidosperma* aff. *costale* have been identified using an affinity for several reasons. *Lepidosperma* is a highly variable genus and there has never been a suitable identification key to use. The two *Lepidospermas* were identified as an aff. because they were the most morphological match to those two species but were not a 100% match. It was the furthest that the identification could progress given the available material, taxonomy information and not having a specialist to obtain advice from in WA.

#### 4.3.4 Flora of Conservation Significance

The targeted flora survey focused on areas of suitable habitat for species with a medium or high likelihood of occurrence within the Survey Area (Table 5).

No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act 2016 were recorded during the survey.

Three Priority species as listed by DBCA were found during the survey. Details pertaining to each species is detailed below and in Table 6.

*Tetratheca pilifera* (P3), is a spreading shrub, 0.1-0.3 m high. It has purple flowers between August and October and favours gravelly soils.



**Plate 1: *Tetratheca pilifera* (P3)**

*Lechenaultia hortii* (P2) is an erect to spreading perennial, herb or shrub (subshrub), to 0.4 m high. The species favours white-cream sandy soils on low slopes and flats and can be found on road verges.



**Plate 2: *Lechenaultia hortii* (P2)** (photo obtained from FloraBase 2020)

*Grevillea olivacea* (P4) is an erect, non-lignotuberous shrub that grows between 1 - 4.5 m high. The flowers are red/red-pink and appear between June and September. The species favours white or grey sand on coastal dune with limestone rocks. Given the location of the survey Area, the two plants that were recorded have most likely been planted and therefore are not considered to be conservation significant.



**Plate 3: *Grevillea olivacea* (P4)**

**Table 6: Recorded Locations of Priority Species in the Survey Area (MGA zone 50)**

Species	Easting	Northing	Number of Plants
<i>Tetratheca pilifera</i> (P3)	441782	6482176	1 (within Quadrat 5)
	445393	6485141	1
	445402	6485144	1
<i>Lechenaultia hortii</i> (P2)	443671	6485233	Within quadrat 4 at 3% equates to approximately 6 – 9 plants
	441779	6482167	Within quadrat 5 at 1.5% equates to approximately 3 – 4 plants
	445319	6485125	Within quadrat 6 at 1% equates to approximately 2 - 3 plants
	445515	6485202	Within quadrat 7 at 2% equates to approximately 4 – 6 plants
<i>Grevillea olivacea</i> (P4)	447140	6486457	2

#### 4.3.5 Introduced Flora

A total of 38 introduced species were recorded within the Survey Area, representing 23.6% of the total taxa recorded (Table 7). Three of these species, the Arum Lily (*\*Zantedeschia aethiopica*), One-leaf Cape Tulip (*\*Moraea flaccida*) and Bridal Creeper (*\*Asparagus asparagoides*) are listed as Declared Pests under the BAM Act (Department of Primary Industries and Regional Development, 2018a) and shown in Figure 11. Bridal creeper is also listed as a WoNS (Department of Environment and Energy, 2018).

**Table 7: Introduced Flora Species within the Survey Area**

Species	Common Name	Status under BAM Act	WoNS
<i>*Acacia podalyriifolia</i>	-	Permitted - s11	-
<i>*Acacia iteaphylla</i>	-	Permitted - s11	-
<i>*Acacia longifolia</i>	-	Permitted - s11	-
<i>*Arctotheca calendula</i>	Cape Weed	Permitted - s11	-
<i>*Asparagus asparagoides</i>	Bridal Creeper	Declared Pest	Yes
<i>*Avena barbata</i>	Bearded Oa	Permitted - s11	-
<i>*Briza maxima</i>	Blow Fly Grass	Permitted - s11	-
<i>*Briza minor</i>	Shivery Grass	Permitted - s11	-
<i>*Bromus diandrus</i>	Great Brome	Permitted - s11	-
<i>*Chamaecytisus palmensis</i>	Tagasaste	Permitted - s11	-

Species	Common Name	Status under BAM Act	WoNS
<i>*Cortaderia selloana</i>	Pampas Grass	Permitted - s11	-
<i>*Cotula coronopifolia</i>	Waterbuttons	Permitted - s11	-
<i>*Echium plantagineum</i>	Paterson's Curse	Permitted - s11	-
<i>*Ehrharta calycina</i>	Perennial Veldt Grass	Permitted - s11	-
<i>*Eragrostis curvula</i>	African Lovegrass	Permitted - s11	-
<i>*Foeniculum vulgare</i>	Fennel	Permitted - s11	-
<i>*Freesia sp.</i>	-	Permitted - s11	-
<i>*Freesia alba × leichtlinii</i>	-	Permitted - s11	-
<i>*Fumaria capreolata</i>	Whiteflower Fumitory	Permitted - s11	-
<i>*Gladiolus caryophyllaceus</i>	Wild Gladiolus	Permitted - s11	-
<i>*Hypochaeris glabra</i>	Smooth Cats-ear	Permitted - s11	-
<i>*Juncus acutus</i>	Spiny Rush	Permitted - s11	-
<i>*Lavandula sp.</i>	Lavender	Permitted - s11	-
<i>*Leptospermum laevigatum</i>	Coastal Teatree	Permitted - s11	-
<i>*Lolium rigidum</i>	Wimmera Ryegrass	Permitted - s11	-
<i>*Lupinus angustifolius</i>	Blue Lupin	Permitted - s11	-
<i>*Lysimachia arvensis</i>	Pimpernel	Permitted - s11	-
<i>*Moraea flaccida</i>	One-leaf Cape Tulip	Declared Pest - s22(2) (Exempt)	-
<i>*Olea europaea</i>	Olive	Permitted - s11	-
<i>*Orobanche minor</i>	Lesser Broomrape	Permitted - s11	-
<i>*Oxalis pes-caprae</i>	Soursob	Permitted - s11	-
<i>*Romulea rosea</i>	Guildford Grass	Permitted - s11	-
<i>*Rumex crispus</i>	Curled Dock	Permitted - s11	-
<i>*Trifolium campestre</i>	Hop Clover	Permitted - s11	-
<i>*Ursinia anthemoides</i>	Ursinia	Permitted - s11	-
<i>*Vinca major</i>	Blue Periwinkle	Permitted - s11	-
<i>*Watsonia meriana var. bulbifera</i>	Bugle Lily	Permitted - s11	-
<i>*Zantedeschia aethiopica</i>	Arum Lily	Declared Pest	-

Arum Lily (*\*Zantedeschia aethiopica*) is a wide spread and conspicuous weed found from the Geraldton area to the south coast (Department of Primary Industries and Regional Development, 2019a). The species is a rhizomatous (tuber-like), perennial, herb that grows to 1 m high. It has white flowers between July and November and prefers loam, sand and swampy areas.

One-leaf Cape Tulip (*\*Moraea flaccida*) is a common weed of pastures, woodlands, granite rocks and limestone heath throughout the south west, south of Jurian, in white sand, grey sandy loam

over limestone, laterite clay and gravel (Hussey *et al.*, 2007). The species is a cormous, perennial herb that grows to 0.75 m. It has yellow and orange/yellow flowers between September and November.

Bridal Creeper (*\*Asparagus asparagoides*) is extremely invasive, spreading rapidly along roadsides, creeklines and bushland. The species is a rhizomatous and tuberous, perennial herb and climber, which grows between 1 to 5 m high. It has white flowers between August and September and grows in a variety of soils such as sand, loam, clay and granite (Department of Primary Industries and Regional Development, 2019b).

The locations and abundance of these three pest plants are detailed in Table 8.

**Table 8: Recorded Locations of Declared Pest species and WoNS in the Survey Area (MGA zone 50)**

Species	Easting	Northing	Number of Plants
<i>*Asparagus asparagoides</i>	439223.76	6480640.74	1
	438625.43	6480434.12	6
	438690.51	6480425.53	2
	438755.49	6480450.63	1
	438773.61	6480443.43	6
	438777.51	6480439.35	2
	447025.54	6486400.09	1
	447412.82	6486584.19	4
	438385.96	6479990.52	4
	438430.32	6479916.08	3
	440705.61	6481200.29	2
	440987.16	6481443.33	2
438933.71	6480531.84	25	
<i>*Moraea flaccida</i>	446188.45	6485739.78	3
	444696.55	6484902.55	2
	444711.32	6484937.55	>50
	440933.07	6481418.08	>100
	440998.47	6481452.15	>100
<i>*Zantedeschia aethiopica</i>	445980.02	6485522.1	2

#### 4.3.6 Vegetation Types

A total of 26 vegetation types were mapped within the Survey Area and covered 27.14 ha. These ranged from intact woodlands in Excellent condition to Completely Degraded scattered mature trees over introduced weed species. Within the 59 ha Survey area; 17.24 ha was cleared (devoid of vegetation) and 14.62 ha consisted of roads. Descriptions of these are listed in Table 9 along

with their extent within the Survey Area and are mapped in Figure 10. Detailed site sheets for each quadrat are provided in Appendix C.

**Table 9: Vegetation Types Occurring within the Survey Area**

Vegetation Type Code	Vegetation Type Description	Extent (ha) in the Survey Area	Extent of vegetation (%) in the Survey Area
EwCc (Q6, Q1, Q2, R2)	Mid Woodland of <i>Eucalyptus wandoo</i> , <i>Eucalyptus marginata</i> , <i>Corymbia calophylla</i> over Mid shrubland of <i>Banksia sessilis</i> , <i>Xanthorrhoea preissii</i> , <i>Hakea lissocarpha</i> and <i>Hibbertia diamesogenos</i> over Low sedgeland of <i>lepidosperma</i> aff. <i>apricola</i> , <i>Tetraria octandra</i> and <i>Lepidosperma</i> aff. <i>costale</i>	6.65	24.49
AhEw (Q7, Q3)	Mid Open forest of <i>Allocasuarina huegeliana</i> with either <i>Eucalyptus wandoo</i> , <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> over Tall sparse shrubland of <i>Banksia sessilis</i> , <i>Banksia squarrosa</i> over Mid open shrubland of <i>Hakea lissocarpha</i> , <i>Hibbertia hypericoides</i> , <i>Hibbertia commutata</i> over Low sparse sedgland of <i>Tetraria octandra</i> , <i>Lepidosperma</i> aff. <i>costatale</i>	3.11	11.47
EwBsq (Q4, Q5)	Mid Open Forest of <i>Eucalyptus wandoo</i> over Tall sparse shrubland of <i>Banksia squarrosa</i> , <i>Banksia sessilis</i> and <i>Gastrolobium spinosum</i> over Low open shrubland of <i>Hibbertia hypericoides</i> , <i>Dampiera lavandulacea</i> over Low sparse sedgeland of <i>Lepidosperma</i> aff. <i>apricola</i> and <i>Lepidosperma</i> aff <i>costale</i>	6.29	23.17
EmCc (R1)	Mid Woodland of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> over Mid sparse shrubland of <i>Xanthorrhoea preissii</i> , <i>Phyllanthus calycinus</i> , <i>Bossiaea eriocarpa</i> , <i>Gastrolobium spinosum</i> over Low sparse sedgeland of <i>Tetraria octandra</i>	0.84	3.09
EpEw	Mid Woodland of <i>Eucalyptus patens</i> and <i>Eucalyptus wandoo</i> over Mid sparse shrubland of <i>Xanthorrhoea preissii</i> , <i>Hakea prostrata</i> , <i>Billardiera fusiformis</i> and <i>Mesomelaena tetragona</i> .	0.99	3.65
EmA?a	Mid Woodland of <i>Eucalyptus marginata</i> over <i>Acacia ?acuminata</i>	0.06	0.22
EmHp	Mid Woodland of <i>Eucalyptus marginata</i> over Mid open shrubland of <i>Hakea prostrata</i> , <i>Xanthorrhoea preissii</i> , <i>Billardiera fusiformis</i> and <i>Mesomelaena tetragona</i>	0.16	0.60
CC	Isolated <i>Corymbia calophylla</i>	0.87	3.20
Ew	Stand of <i>Eucalyptus wandoo</i>	1.95	7.17
NeEm	Woodland of Non-endemic <i>Eucalyptus</i> and <i>Eucalyptus marginata</i> over planted <i>Melaleuca huegelii</i>	0.18	0.65



Vegetation Type Code	Vegetation Type Description	Extent (ha) in the Survey Area	Extent of vegetation (%) in the Survey Area
ErBs	Mid Woodland of <i>Eucalyptus rudis</i> over Tall open shrubland of <i>Banksia sessilis</i> , <i>Hakea prostrata</i> , <i>Acacia pulchella</i> and <i>Billardiera fusiformis</i>	0.09	0.33
Em	Isolated <i>Eucalyptus marginata</i>	0.04	0.14
Er	Stand of <i>Eucalyptus rudis</i>	0.14	0.50
ErMv*Ja	Isolated clumps of trees of <i>Eucalyptus rudis</i> over Tall open shrubland of <i>Melaleuca viminea</i> over Low sedgeland of * <i>Juncus acutus</i> over Low grasses of * <i>Cynodon dactylon</i> , * <i>Pennisetum clandestinum</i> and * <i>Watsonia meriana</i> var. <i>bulbillifera</i>	1.04	3.83
ErAh	Mid Woodland of <i>Eucalyptus rudis</i> and <i>Allocasuarina huegeliana</i> over weeds	0.44	1.61
Tsp*Ja (R3)	Low Forbland of <i>Tecticornia</i> sp. with * <i>Juncus acutus</i> , <i>Isolepis cernua</i> * <i>Cotula coronopifolia</i> with scattered <i>Eucalyptus rudis</i>	0.41	1.52
ErLc	Isolated clumps of trees of <i>Eucalyptus rudis</i> over tall open shrubland of <i>Acacia saligna</i> over Low sedgeland of <i>Leptocarpus coangustata</i> , * <i>Juncus acutus</i> and <i>Lepidosperma</i> sp.	0.51	1.88
*Ja	Low Sedgeland of * <i>Juncus acutus</i>	0.38	1.40
ErSs	Mid Woodland of <i>Eucalyptus rudis</i> and <i>Eucalyptus wandoo</i> over Low sparse sedgeland of <i>Schoenus subfascicularis</i> and grass weeds	0.38	1.40
EwXp	Mid Woodland of <i>Eucalyptus wandoo</i> over Mid open shrubland of <i>Xanthorrhoea preissii</i> , <i>Macrozamia riedlei</i> and <i>Dianella revoluta</i> (regrowth from gravel extraction pit)	0.81	2.99
MvEw	Tall closed shrubland of <i>Melaleuca viminea</i> with scattered <i>Eucalyptus wandoo</i>	0.76	2.81
Mv*Ja	Tall closed shrubland of <i>Melaleuca viminea</i> over Low sedgeland of * <i>Juncus acutus</i>	0.53	1.94
MvBa (R4)	Tall Closed shrubland of <i>Melaleuca viminea</i> over Low closed sedgeland of <i>Baumea articulata</i> over Low grassland of * <i>Avena barbata</i> , * <i>Briza maxima</i> and <i>Bromus diandrus</i> .	0.06	0.24
ErSg (R5)	Mid Woodland of <i>Eucalyptus rudis</i> over Tall open shrubland of <i>Melaleuca viminea</i> over Low scattered Forbs of <i>Stypandra glauca</i> , <i>Dianella revoluta</i> , <i>Sowerbaea laxiflora</i> and <i>Kennedia prostrata</i>	0.31	1.15
Mv	Stand of <i>Melaleuca viminea</i>	0.08	0.31

Vegetation Type Code	Vegetation Type Description	Extent (ha) in the Survey Area	Extent of vegetation (%) in the Survey Area
GoAb	*Planted <i>Grevillea olivacea</i> and * <i>Acacia baileyana</i> and weeds	0.07	0.25
<b>Total</b>		<b>27.14</b>	<b>100</b>

The survey undertaken in 2015 (Terratree Pty Ltd, 2015) described seven vegetation communities, these communities were similar to the intact vegetation types described in the above table. As Terratree's vegetation mapping is incomplete and broader than the current survey, additional vegetation types have now been mapped to describe all vegetation within the Project Area.

#### 4.3.7 Vegetation Condition

Vegetation condition within the Survey Area ranged from Excellent to Completely Degraded. The majority of the vegetation in the Survey Area was in Excellent condition (13%). Disturbances included litter and weeds. Vegetation condition within the Survey Area is summarised below in Table 10 and illustrated in Figure 11.

**Table 10: Vegetation Condition within the Survey Area**

Vegetation Condition	Extent within the Survey Area (ha)	Extent within the Survey Area (%)
Excellent	7.93	13
Very Good	2.72	5
Good	5.85	10
Degraded	6.55	11
Degraded to Completely Degraded	1.44	2
Completely Degraded	2.6	4
Existing Road	14.62	25
Cleared	17.29	29
<b>Total</b>	<b>59</b>	<b>100.0</b>

#### 4.3.8 Threatened and Priority Ecological Communities

The desktop assessment identified one TEC under the EPBC Act which is also a PEC listed by the State occurring within 15 km of the Survey Area, Eucalypt Woodlands of the Western Australian Wheatbelt. Two vegetation types EwCc and EwBsq, were of similar characteristics to the TEC/PEC, however, according to the conservation advice for the Eucalypt Woodlands, the TEC/PEC occurs in areas that receive <600 mm of rainfall a year. Given the Survey Area lies within the average rainfall isohyet of 600-1000 mm annually, it is considered that Eucalypt Woodlands of the Western Australian Wheatbelt does not occur in the Survey Area.

#### 4.3.9 Regional Representation

Vegetation mapping types described in the Survey Area were correlated with the Beard (1976) and Shepherd, Beeston and Hopkins (2002) broad vegetation types by examining similarities in vegetation descriptions. Differences exist with the terminology used in the descriptions as they are based on different methods of categorising and characterising vegetation types, and the different spatial scale of the analysis (i.e. region vs. local scale) (Table 11).

**Table 11: Representation of Broad Vegetation Types and Corresponding Vegetation Types**

Vegetation Type	Corresponding Vegetation Association (Current Survey)	Extent in Survey Area (ha)
<b>Bannister 1006</b>	AhEw	3.11
	EmCc	0.84
	ErLc	0.51
	ErMv*Ja	1.04
	ErSs	0.38
	EwBsq	6.29
	EwCc	6.65
	EwXp	0.81
	Tsp*Ja	0.41
<b>East Darling 3003</b>	AhEw	3.3
	EmCc	0.84
	ErLc	0.51
	ErMv*ja	1.04
	ErSg	0.31
	EwBsq	6.29
	EwCc	6.65
	MvEw	0.76

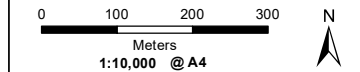


**Legend**

- Survey Area Boundary
- Quadrats and Releve Locations**
  - Quadrat Locations
  - Releve Location
- Vegetation Type**
  - ErAh
  - ErBs
  - ErLc
  - ErMv\*Ja
  - Ew
  - EwBsq
  - EwCc
  - NeEm
  - Road
  - Tsp\*Ja
  - AhEw
  - Cc
  - Cleared
  - Em
  - EmA?a
  - EmCc
  - EmHp
  - EpEw
  - Er

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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**LOCALITY MAP**



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<b>HORIZONTAL DATUM AND PROJECTION</b> GDA 1994 MGA Zone 50			
<b>CREATED</b> LF	<b>CHECKED</b> NW	<b>APPROVED</b> NW	<b>REVISION</b> 3

**Main Roads WA**  
 Great Eastern Highway, Coates Gully  
 (SLK 55.8 –68.7)

**Detailed Flora and Vegetation Survey**

**Figure 10a**  
 Vegetation Types



### Legend

- Survey Area Boundary

#### Quadrats and Releve Locations

- Quadrat Locations
- ▲ Releve Location

#### Priority Flora

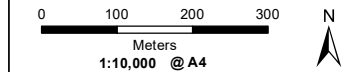
- *Lechenaultia hortii* (P2)
- *Tetratheca pilifera* (P2)

#### Vegetation Types

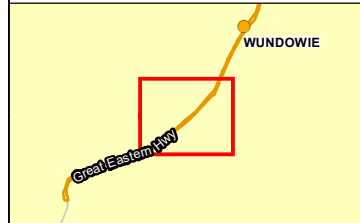
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<span style="background-color: #FFD700; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> EmCc	<span style="background-color: #00FF00; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Ew
<span style="background-color: #4682B4; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> EpEw	<span style="background-color: #ADD8E6; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> EwBsq
<span style="background-color: #800080; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Er	<span style="background-color: #90EE90; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> EwCc
<span style="background-color: #3CB371; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> ErAh	<span style="background-color: #4169E1; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> EwXp
<span style="background-color: #8A2BE2; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> ErLc	<span style="background-color: #9ACD32; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Tsp*Ja
	<span style="background-color: #A9A9A9; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Cleared
	<span style="border: 1px solid black; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Road

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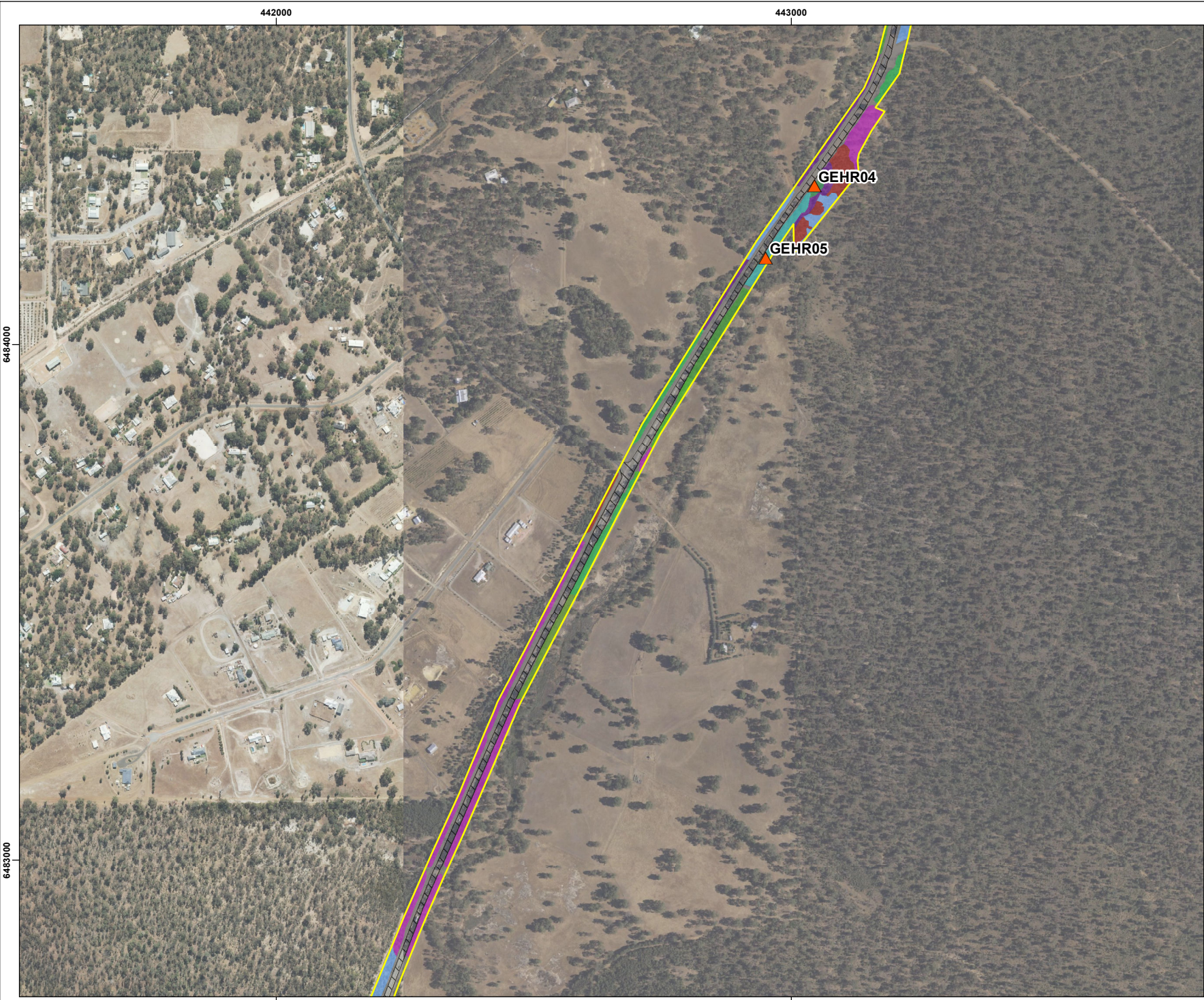
HORIZONTAL DATUM AND PROJECTION  
 GDA 1994 MGA Zone 50

CREATED LF	CHECKED NW	APPROVED NW	REVISION 3
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**Main Roads WA**  
 Great Eastern Highway, Coates Gully  
 (SLK 55.8 –68.7)

**Detailed Flora and Vegetation Survey**

### Figure 10b Vegetation Types



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6483000

6484000

6483000

**Legend**

Survey Area Boundary

**Quadrats and Releve Locations**

▲ Releve Location

**Vegetation Types**

AhEw	Ew
Cc	EwBsq
ErAh	Mv*Ja
ErMv*Ja	MvBa
ErSg	MvEw
	Cleared
	Road

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**LOCALITY MAP**



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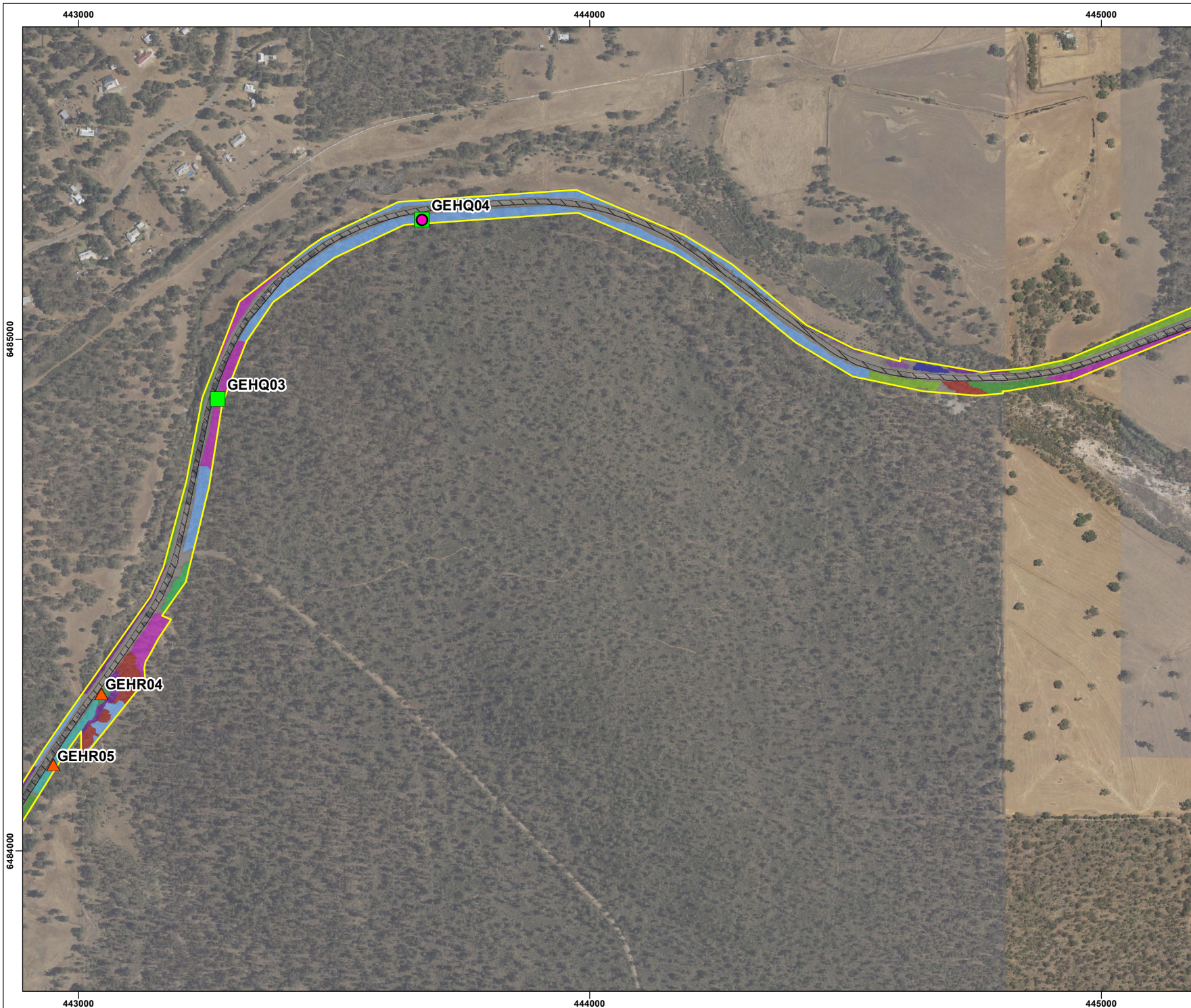
HORIZONTAL DATUM AND PROJECTION  
 GDA 1994 MGA Zone 50

CREATED LF	CHECKED NW	APPROVED NW	REVISION 3
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**Main Roads WA**  
 Great Eastern Highway, Coates Gully  
 (SLK 55.8 –68.7)

**Detailed Flora and Vegetation Survey**

**Figure 10c**  
 Vegetation Types

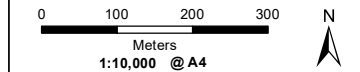


### Legend

- Survey Area Boundary
- Quadrats and Releve Locations**
- Quadrat Locations
- Releve Location
- Priority Flora**
- Lechenaultia hortii* (P2)
- Vegetation Types**
- AhEw
- Er
- ErMv\*Ja
- ErSg
- Ew
- EwBsq
- EwCc
- Mv
- Mv\*Ja
- MvBa
- MvEw
- Cleared
- Road

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 GDA 1994 MGA Zone 50

<b>CREATED</b> LF	<b>CHECKED</b> NW	<b>APPROVED</b> NW	<b>REVISION</b> 3
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**Main Roads WA**  
 Great Eastern Highway, Coates Gully  
 (SLK 55.8 –68.7)

**Detailed Flora and Vegetation Survey**

**Figure 10d**  
**Vegetation Types**

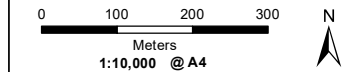


### Legend

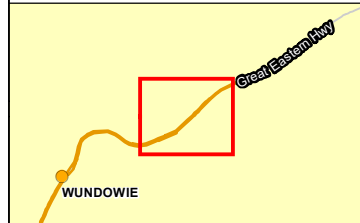
- Survey Area Boundary
- Quadrats and Relieve Locations**
- Quadrat Locations
- Relieve Location
- Priority Flora**
- Lechenaultia hortii* (P2)
- Tetratheca pilifera* (P2)
- Vegetation Types**
- AhEw
- Cc
- EmCc
- Ew
- EwCc
- GoAb
- Mv\*Ja
- MvEw
- Cleared
- Road

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	NW	NW	3

**Main Roads WA**  
 Great Eastern Highway, Coates Gully  
 (SLK 55.8 –68.7)

**Detailed Flora and Vegetation Survey**

**Figure 10e**  
**Vegetation Types**

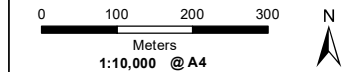




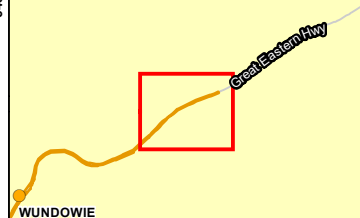
- Legend**
- Survey Area Boundary
  - Quadrats and Releve Locations**
  - ▲ Releve Location
  - Priority Flora**
  - *Grevillea olivacea* (P4)
  - Vegetation Types**
  - EwCc
  - Cc
  - EmCc
  - Ew
  - GoAb
  - Cleared
  - Road

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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CREATED LF	CHECKED NW	APPROVED NW	REVISION 3

**Main Roads WA**  
 Great Eastern Highway, Coates Gully  
 (SLK 55.8 –68.7)

**Detailed Flora and Vegetation Survey**

**Figure 10f**  
**Vegetation Types**

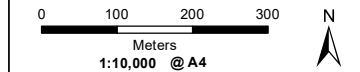


**Legend**

- Survey Area Boundary
- Vegetation Condition**
- Excellent
- Very Good
- Good
- Degraded
- Completely Degraded
- Cleared
- Road

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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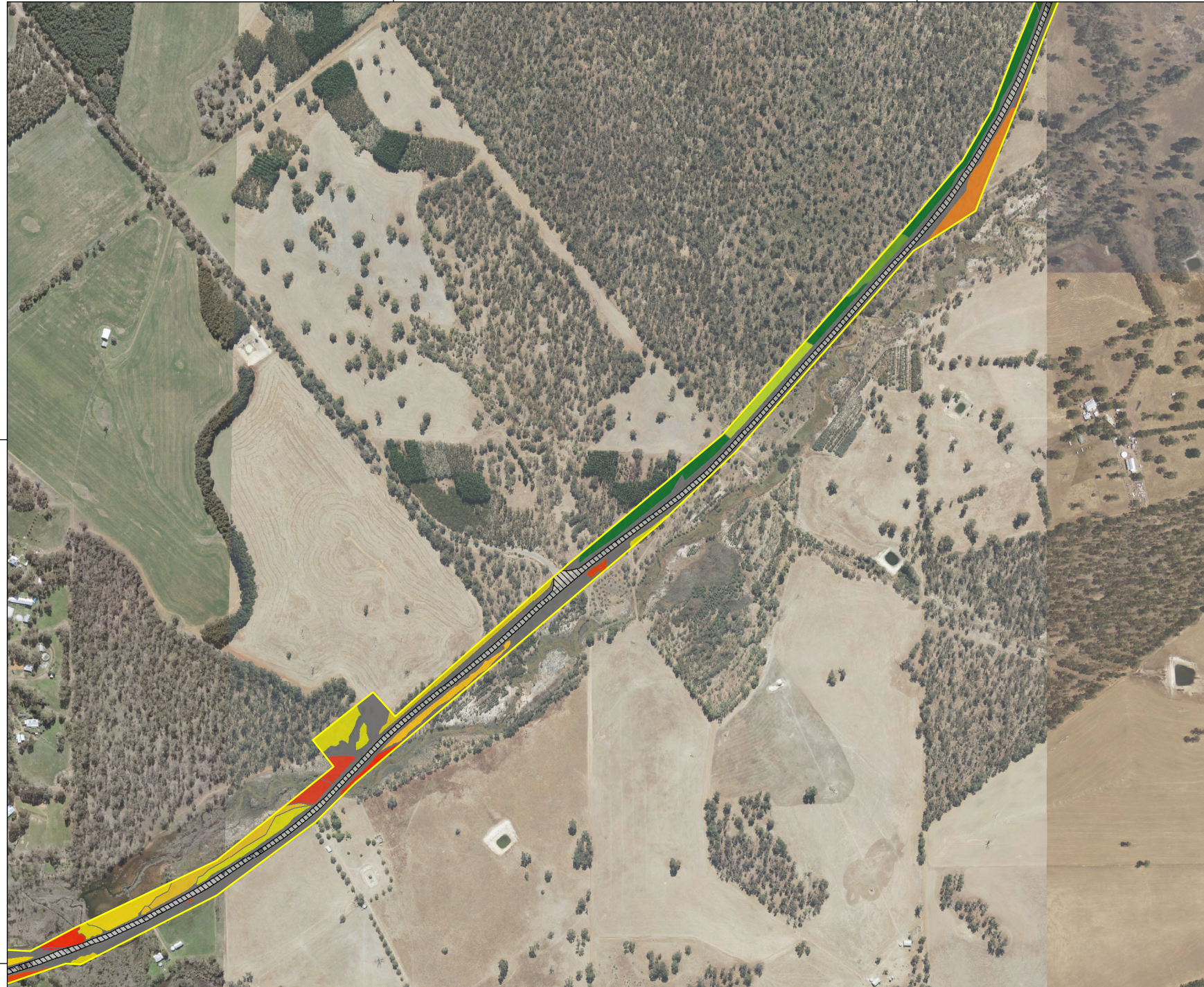
**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50










<b>CREATED</b> LF	<b>CHECKED</b> NW	<b>APPROVED</b> NW	<b>REVISION</b> 3
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**Main Roads WA**  
 Great Eastern Highway, Coates Gully  
 (SLK 55.8 –68.7)

**Detailed Flora and Vegetation Survey**

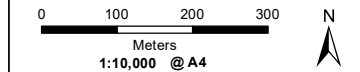
**Figure 11a**  
**Vegetation Condition**



- Legend**
-  Survey Area Boundary
  - Vegetation Condition**
  -  Excellent
  -  Very Good
  -  Good
  -  Degraded
  -  Degraded - Completely Degraded
  -  Completely Degraded
  -  Cleared
  -  Road

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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 - OTHER DATA SOURCED LANDGATE 2018  
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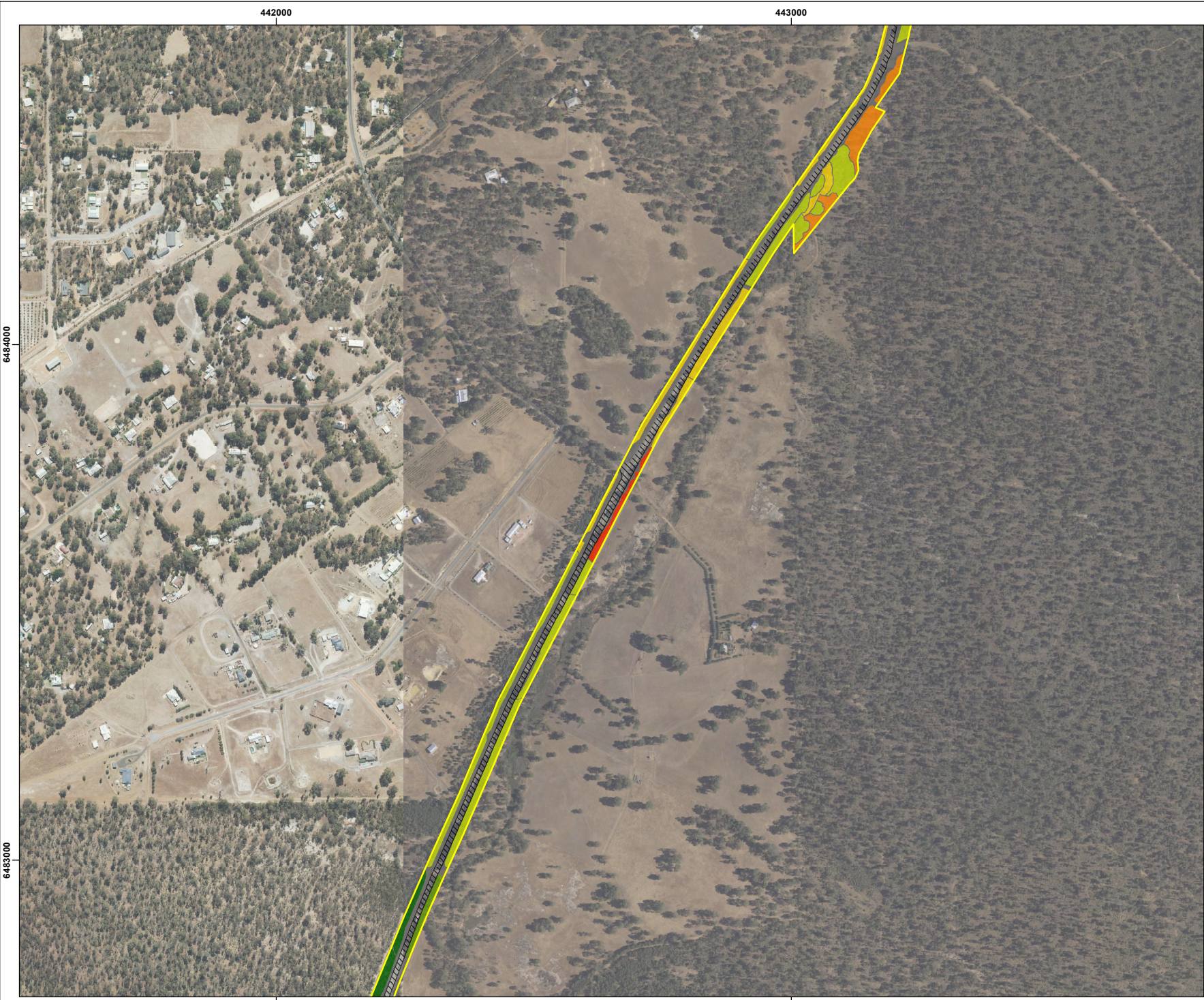
HORIZONTAL DATUM AND PROJECTION  
 GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	NW	NW	3

**Main Roads WA**  
 Great Eastern Highway, Coates Gully  
 (SLK 55.8 –68.7)

**Detailed Flora and Vegetation Survey**

**Figure 11b**  
 Vegetation Condition



6484000










6483000

442000

443000

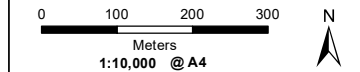
442000

443000

- Legend**
-  Survey Area Boundary
  - Vegetation Condition**
  -  Excellent
  -  Very Good
  -  Good
  -  Degraded
  -  Degraded - Completely Degraded
  -  Completely Degraded
  -  Cleared
  -  Road

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

<b>CREATED</b> LF	<b>CHECKED</b> NW	<b>APPROVED</b> NW	<b>REVISION</b> 3
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**Main Roads WA**  
 Great Eastern Highway, Coates Gully  
 (SLK 55.8 –68.7)

**Detailed Flora and Vegetation Survey**

**Figure 11c**  
**Vegetation Condition**

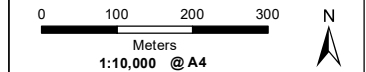


### Legend

- Survey Area Boundary
- Vegetation Condition**
- Excellent
- Very Good
- Good
- Degraded
- Degraded - Completely Degraded
- Completely Degraded
- Cleared
- Road

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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### LOCALITY MAP



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HORIZONTAL DATUM AND PROJECTION GDA 1994 MGA Zone 50			
CREATED LF	CHECKED NW	APPROVED NW	REVISION 3

**Main Roads WA**  
**Great Eastern Highway, Coates Gully**  
**(SLK 55.8 –68.7)**

**Detailed Flora and Vegetation**  
**Survey**

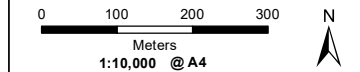
**Figure 11d**  
**Vegetation Condition**



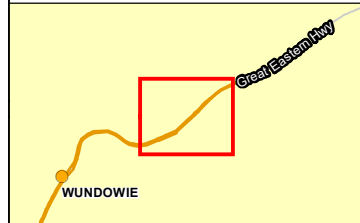
- Legend**
- Survey Area Boundary
  - Vegetation Condition**
  - Excellent
  - Very Good
  - Good
  - Degraded
  - Completely Degraded
  - Cleared
  - Road

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
 - LOCALITY MAP SOURCED LANDGATE 2017  
 - OTHER DATA SOURCED LANDGATE 2018  
 - AERIAL PHOTOGRAPHY SOURCED LANDGATE 2018  
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**LOCALITY MAP**



<b>PROJECT ID</b> 3564	<b>DATE</b> 18/03/2020
---------------------------	---------------------------

**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

<b>CREATED</b> LF	<b>CHECKED</b> NW	<b>APPROVED</b> NW	<b>REVISION</b> 3
----------------------	----------------------	-----------------------	----------------------

**Main Roads WA**  
**Great Eastern Highway, Coates Gully**  
**(SLK 55.8 –68.7)**

**Detailed Flora and Vegetation**  
**Survey**

**Figure 11e**  
**Vegetation Condition**

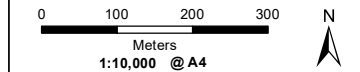


**Legend**

- Survey Area Boundary
- Vegetation Condition**
- Excellent
- Very Good
- Good
- Degraded
- Completely Degraded
- Cleared
- Road

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
 - LOCALITY MAP SOURCED LANDGATE 2017  
 - OTHER DATA SOURCED LANDGATE 2018  
 - AERIAL PHOTOGRAPHY SOURCED LANDGATE 2018  
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**LOCALITY MAP**



<b>PROJECT ID</b>	<b>DATE</b>
3564	18/03/2020

**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

<b>CREATED</b>	<b>CHECKED</b>	<b>APPROVED</b>	<b>REVISION</b>
LF	NW	NW	3

**Main Roads WA**  
 Great Eastern Highway, Coates Gully  
 (SLK 55.8 –68.7)

**Detailed Flora and Vegetation Survey**

**Figure 11f**  
**Vegetation Condition**

## 5 Discussion

### 5.1 Flora

The suite of flora taxa recorded during the survey is considered typical for the respective areas (Beard, 1976) and aligns with the database search results obtained. Despite the below-average rainfall recorded for the three months prior to commencing the survey, the floristic diversity was considered to be within the expected range for the bioregions and the timing of the survey when undertaken. However, the below average rainfall has resulted in a lower than normal herb and annual species richness.

### 5.2 Flora of Conservation Significance

The review of the database searches identified 46 conservation significant flora species as potentially occurring in the vicinity of the Survey Area. Three Priority flora species; *Tetradthea pilifera*, *Lechenaultia hortii* and *Grevillea olivacea* were recorded within the Survey Area.

*Tetradthea pilifera* is a Priority 3 species and was recorded within one quadrat (GEHQ05) and opportunistically collected at one other location. There are eight DBCA records of the species identified within 15 km of the Survey Area. This species was also recorded in a previous survey undertaken along the Survey Area (Terratree Pty Ltd, 2015).

*Lechenaultia hortii* is a Priority 2 species. The specimen collected was submitted to the Western Australia herbarium for formal identification to confirm its identity as the species is typically known to occur approximately 24 km further south than the Survey Area in a cluster. This implies that its occurrence at this location is also a slight northern range extension. This species was found at four locations within quadrats 4, 5, 6 and 7.

*Grevillea olivacea* is listed as a Priority 4 and was recorded within the Survey Area as an opportunistic collection. This species was identified on the road verge of a private property and is likely to have been planted and is therefore not considered to be naturally occurring.

The pre-survey likelihood assessment resulted in ten species being determined as having a high likelihood of occurrence within the Survey Area based on known distribution and habitat types, which included:

- *Senecio gilbertii* (P1) is an erect, slender, perennial herb ranging up to 1.5 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are yellow and occur between September to November. There are two DBCA records occurring within 5 km of the Survey Area. As the survey was undertaken within the flowering period of the species, it is considered that if the species were to occur within the Survey Area it would have likely been identified.
- *Adenanthos cygnorum* subsp. *chamaephyton* (P3) is a prostrate, mat forming, shrub ranging up to 0.3 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are white-cream-pink-green and have been recorded in July, September to December and January (Department of Biodiversity Conservation and Attractions, 2019b). There are 13 DBCA records occurring within 15 km of the Survey Area. As this



survey was undertaken within one of the flowering periods (i.e. October), it is considered if the species were to occur within the Survey Area it would have likely been recorded.

- *Meionectes tenuifolia* (P3) is a semi aquatic, annual herb ranging up to 0.5 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are orange in colour and can occur between September and December. There are four DBCA records occurring within 15 km of the Survey Area, of which the closest is located within 5 km. it is considered if the species were to occur within the Survey Area it would have likely been recorded.
- *Thysanotus cymosus* (P3) is a caespitose perennial, ranging up to 0.3 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are purple and occur in September and October. There are three DBCA records of the species within 15 km of the Survey Area of which the closest is 0.3 km away from the northernmost point of the Survey Area. The survey was undertaken during the species flowering period and therefore would have been found if present.
- *Asterolasia grandiflora* (P4) is a slender, open shrub ranging up to 0.8 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are pink/white and occur from July to October. There are ten DBCA records within 15km of the Survey of which the closest record is within 5 km. As the survey was undertaken within the flowering period for the species, it is considered that if the species were to occur within the Survey Area it would have likely been identified.
- *Cyanicula ixiooides* subsp. *ixiooides* (P4) is a tuberous perennial herb ranging up to 0.15 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are yellow and occur between August and October (Department of Biodiversity Conservation and Attractions, 2019b). There are 19 DBCA records within the Survey Area of which the closest is located 900 m from the Survey Area boundary. As the survey was undertaken within the flowering period for the species, it is considered that if the species were to occur within the Survey Area it would have likely been identified.
- *Daviesia oxylobium* (P4) is a glaucous shrub ranging between 0.5 to 1 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are yellow, red and pink and occur July to August (Department of Biodiversity Conservation and Attractions, 2019b). There is one DBCA record located within 5km of the Survey Area. As no shrub suspected to be this species was detected during the exhaustive search of the survey area it is unlikely to occur.
- *Grevillea pimeleoides* (P4) is a non-lignotuberous shrub ranging between 0.4 to 2.4 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are yellow-orange and occur may to November (Department of Biodiversity Conservation and Attractions, 2019b). There are two DBCA records of the species both of which are recorded approximately 4.6 km from the Survey Area. As the survey was undertaken

within the flowering period for the species it is considered that if the species were to occur within the Survey Area it would have been recorded.

- *Hibbertia montana* (P4) is a erect, sprawling shrub ranging from 0.1 to 0.7 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are yellow and occur between July to October (Department of Biodiversity Conservation and Attractions, 2019b). There are three DBCA records of the species within 15 km of the Survey Area of which the closest is located 1.7 km away. As the survey was undertaken with the flowering period for the species, it is considered that if the species were to occur within the Survey Area it likely would have been recorded.
- *Stylidium striatum* (P4) is a perennial herb ranging between 0.15 to 0.55 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are yellow and occur from October to November. There are two DBCA records of the species located within 15 km of the Survey Area of which the closest is 0.5 km from the northern most boundary of the Survey Area. As the survey was undertaken with the flowering period for the species, it is considered that if the species were to occur within the Survey Area it likely would have been recorded.

Based on the habitat type present and known distribution, nine species have a medium likelihood of occurrence within the Survey Area, these are as follows:

- *Acacia aphylla* (T, VU) is a divaricately branched, spinescent shrub ranging between 0.9 to 2.5 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are yellow and occur between August and October. There are 26 DBCA records of the species within 15 km of the Survey Area of which the closest is 6.7 km away. As the survey was undertaken within the flowering period of the species and due to the distinct nature of the shrub species it is considered that if the species were to occur within the Survey Area it would have likely been recorded. Additionally, *Acacia* species were targeted during the survey, with nine different *Acacia* species recorded during the Survey.
- *Drosera albonotata* (P2) is a rosetted herb species. There is limited information available from the 12 records within the Herbarium database. There are three DBCA records of the species within 15km of the Survey Area of which the closest is 9.2 km away. As the survey was undertaken with the flowering period for the species, it is considered that if the species were to occur within the Survey Area it likely would have been recorded.
- *Grevillea candolleana* (P2) is a spreading shrub ranging between 0.2 and 0.8 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are white-cream and occur from August to September. There are 16 DBCA records of the species within 15 km of the Survey Area of which the closest is 8.3 km away. As no shrub suspected to be this species was detected during the exhaustive search of the survey area it is unlikely to occur.

- *Acacia campylophylla* (P3) is a dense, rigid, spreading shrub ranging between 0.1 to 0.6 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are yellow and occur from July to August. There are two DBCA records of the species within 15 km of the Survey Area. Even though the survey was undertaken outside the flowering period of the species, specimens can be identified using morphological characteristics of the phyllodes and pods. No shrubs thought to be *Acacia campylophylla* were located during the survey.
- *Asteridea gracilis* (P3) is an annual herb species ranging between 0.15 to 0.35 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are white-pink and occur September to December. There is one DBCA record of the species located 6.3 km from the Survey Area. As the survey was undertaken within the flowering period for the species, it is considered that if the species were to occur within the Survey Area it would have likely been identified.
- *Chordifex chaunocoleus* (P4) is a rhizomatous, erect, perennial, herb ranging between 0.15 to 0.5 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are brown and occur in September. There are five DBCA records of the species within 15 km of the Survey Area of which the closest is 6.6 km away. Even though the survey was undertaken outside the flowering period of the species, they are perennial erect herbs that occur as clumps which could have been located during the field survey. No specimens of similar characteristics were located during the survey.
- *Eucalyptus loxophleba x wandoo* (P4) is a tree ranging between 4 and 20 m high (Department of Biodiversity Conservation and Attractions, 2019b). Due to the hybrid nature of the species flowering information is limited. There are three DBCA records of the species, of which they are all approximately 7.4 km away from the Survey Area. Tree species were opportunistically collected throughout the survey. Although flowering information for the species is limited, due to the distinct nature of Eucalypt species it is considered that if the species were to occur within the Survey Area it would have likely been identified.
- *Sowerbaea multicaulis* (P4) is a tufted perennial herb ranging between 0.07 to 0.25 m high (Department of Biodiversity Conservation and Attractions, 2019b). Flowers are purple and occur October to January. There is one DBCA record of the species located 8.4 km from the Survey Area. As the survey was undertaken within the flowering period for the species, it is considered that if the species were to occur within the Survey Area it would have likely been identified.
- *Trithuria australis* (P4) is a small annual herb (Department of Biodiversity Conservation and Attractions, 2019b). Flowers occur October to December. There are two DBCA records of the species within 15 km of the Survey Area of which the closest is approximately 7.1 km away. As the survey was undertaken within the flowering period for the species, it is considered that if the species were to occur within the Survey Area it would have likely been identified.

Post field survey, 45 species were considered to have a low likelihood of occurrence in the Survey Area given the habitat found in the Survey Area and the extensive targeted survey for significant species.

### 5.3 Introduced Flora

Three Declared Pests were recorded during the Survey Area; the Arum Lily (*\*Zantedeschia aethiopica*), One-leaf Cape Tulip (*\*Moraea flaccida*) and Bridal Creeper (*\*Asparagus asparagoides*). Of these, Bridal Creeper is also listed as a WoNS (Department of Environment and Energy, 2018).

Additionally, the weed *\*Juncus acutus* was recorded in one relevé (GEHR03) and opportunistically recorded in several locations in the survey Area. This species has been acknowledged as a rapidly invasive weed species across the Swan Coastal Plain where it occupies high quality riverine, estuarine and saline marsh habitats, displacing native species (Department of Environment and Conservation, 2006). To prevent the species spreading further, continual management of the species is recommended. *\*Juncus acutus* is an erect very spiny plant that forms a perennial tussock up to 2m high. Herbicide control of large, dense infestations can kill the plant; however, the outcome can result in significant dead biomass that could prevent regeneration of native species and create high fuel loads. Carefully controlled burning of the biomass would reduce the fuel load after the plants have been sprayed and may also promote regeneration of the native plant community. Ongoing management will be required for several years after the initial control.

### 5.4 Vegetation of Conservation Significance

Outcomes from the desktop study identified that one TEC in the *Eucalypt Woodlands of the Western Australian Wheatbelt* has a likelihood of occurring within the Survey Area. This vegetation community is listed as a Priority 3 under the State and is listed as a Critically Endangered under the Federal EPBC Act.

Several of the 26 vegetation types identified during the survey did not show any community structure and consist of only mature trees and shrubs over weeds. The dominant intact vegetation types were identified as:

- EwCc (Q6, Q1, Q2): Mid Woodland of *Eucalyptus wandoo*, *Eucalyptus marginata*, *Corymbia calophylla*
- AhEw (Q7, Q3): Mid Open forest of *Allocasuarina huegeliana* with either *Eucalyptus wandoo*, *Corymbia calophylla* and *Eucalyptus marginata*
- EwBsq (Q4, Q5): Mid Open Forest of *Eucalyptus wandoo*.

Due to the limited data available and published datasets for the Darling Plateau/ Jarrah forest IBRA region it is not possible to run statistical comparisons against the data collected from this survey. Instead, a comprehensive literature review that included documents, scientific papers, regional mapping and conservation advice produced by the Australian government was used to establish the conservation significance of the vegetation types mapped within the Survey Area

(McKenzie *et al.*, 1996; Williams and Mitchell, 2001; Hopper and Gioia, 2004; Harvey and Keighery, 2012; Department of the Environment, 2015; Main Roads WA, 2019).

Further investigation of vegetation types EwCc and EwBsq was completed based on the key diagnostic characteristics outlined in the *Eucalypt Woodland of the Western Australian Wheatbelt Conservation Advice* (Department of the Environment, 2015). The outcomes from the assessment can conclude that even though vegetation types EwCc and EwBsq meet several of the key diagnostic characteristics of Eucalypt woodlands, the Survey Area is located with the 600-1000 mm rainfall isohyet and therefore outside the rainfall zone considered to contain the TEC. As stated in the Conservation Advice, Eucalypt Woodlands of the Western Australian Wheatbelt generally falls within the 300 to 600 mm average annual rainfall. Based on this information, the vegetation within the Survey Area is not considered to be the TEC Eucalypt Woodlands of the Western Australian Wheatbelt.

## 6 Conclusion

In summary, the following conclusions on the existing flora and vegetation are made:

- No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act 2016 were recorded during the survey
- Three DBCA listed Priority flora were recorded: *Tetratheca pilifera* (P3), *Lechenaultia hortii* (P2) and *Grevillea olivacea* (P4)
- 38 introduced species were recorded during the survey. Three of these species, Arum Lily (*\*Zantedeschia aethiopica*), One-leaf Cape Tulip (*\*Moraea flaccida*) and Bridal Creeper (*\*Asparagus asparagoides*) are listed as Declared Pests under the BAM Act. Bridal creeper is also listed as a WoNS
- Further investigation of vegetation types EwCc and EwBsq was completed based on the key diagnostic characteristics outlined in the *Eucalypt Woodland of the Western Australian Wheatbelt Conservation Advice* (Department of the Environment, 2015). The outcomes from the assessment can conclude that even though vegetation types EwCc and EwBsq meet several of the key diagnostic characteristics of Eucalypt woodlands, the Survey Area is located with the 600-1000 mm rainfall isohyet and therefore outside the rainfall zone considered to contain the TEC. As stated in the Conservation Advice, Eucalypt Woodlands of the Western Australian Wheatbelt generally falls within the 300 to 600 mm average annual rainfall and within the Jarrah Forest bioregion. Based on this advice, the vegetation within the Survey Area is not considered to be the *TEC Eucalypt Woodlands of the Western Australian Wheatbelt*.

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# Appendices

# Appendix A Database Searches

# NatureMap Species Report

Created By Colleen McDonald on 02/12/2019

**Kingdom** Plantae  
**Current Names Only** Yes  
**Core Datasets Only** Yes  
**Method** 'By Circle'  
**Centre** 116° 23' 31" E, 31° 46' 58" S  
**Buffer** 15km  
**Group By** Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	665	1569
Priority 1	1	2
Priority 2	6	28
Priority 3	11	33
Priority 4	12	51
Rare or likely to become extinct	1	10
<b>TOTAL</b>	<b>696</b>	<b>1693</b>

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
<b>Rare or likely to become extinct</b>				
1.	3220 <i>Acacia aphylla</i> (Leafless Rock Wattle)		T	
<b>Priority 1</b>				
2.	8205 <i>Senecio gilbertii</i>		P1	
<b>Priority 2</b>				
3.	32205 <i>Banksia nivea</i> subsp. <i>Morangup</i> (M. Pieroni 94/2)		P2	
4.	13827 <i>Cyanicula ixiooides</i> subsp. <i>candida</i>		P2	
5.	48681 <i>Drosera albonotata</i>		P2	
6.	1975 <i>Grevillea candolleana</i>		P2	
7.	46516 <i>Lasiopetalum trichanthera</i>		P2	
8.	14710 <i>Verticordia citrella</i>		P2	
<b>Priority 3</b>				
9.	3252 <i>Acacia campylophylla</i>		P3	
10.	11336 <i>Adenanthos cygnorum</i> subsp. <i>chamaephyton</i>		P3	
11.	7849 <i>Asteridea gracilis</i>		P3	
12.	5390 <i>Beaufortia purpurea</i> (Purple Beaufortia)		P3	
13.	33638 <i>Meioneetes tenuifolia</i>		P3	
14.	12924 <i>Stylidium asteroideum</i> (Star Triggerplant)		P3	
15.	31765 <i>Synaphea diabolica</i>		P3	
16.	4540 <i>Tetradlea pilifera</i>		P3	
17.	1327 <i>Thysanotus cymosus</i>		P3	
18.	12431 <i>Verticordia huegelii</i> var. <i>tridens</i>		P3	
19.	12460 <i>Verticordia serrata</i> var. <i>linearis</i>		P3	
<b>Priority 4</b>				
20.	11957 <i>Anigozanthos humilis</i> subsp. <i>chrysanthus</i> (Golden Catspaw)		P4	
21.	4398 <i>Asterolasia grandiflora</i>		P4	
22.	17827 <i>Chordifex chaunocoleus</i>		P4	
23.	13826 <i>Cyanicula ixiooides</i> subsp. <i>ixiooides</i>		P4	
24.	14755 <i>Daviesia oxylobium</i>		P4	
25.	13819 <i>Eremaea blackwelliana</i>		P4	
26.	16886 <i>Eucalyptus loxophleba</i> x <i>wandoo</i>		P4	
27.	13086 <i>Grevillea pimeleoides</i>		P4	
28.	5146 <i>Hibbertia montana</i>		P4	
29.	1313 <i>Sowerbaea multicaulis</i> (Many Stemmed Lily)		P4	
30.	7803 <i>Stylidium striatum</i> (Fan-leaved Triggerplant)		P4	
31.	33019 <i>Trithuria australis</i>		P4	
<b>Non-conservation taxon</b>				
32.	15466 <i>Acacia applanata</i>			
33.	18285 <i>Acacia baileyana</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
		Y		
34.	3233 <i>Acacia barbinervis</i>			
35.	15469 <i>Acacia barbinervis</i> subsp. <i>barbinervis</i>			
36.	3254 <i>Acacia celastrifolia</i> (Glowing Wattle)			
37.	3257 <i>Acacia chrysocephala</i>			
38.	3307 <i>Acacia divergens</i>			
39.	11303 <i>Acacia drummondii</i> subsp. <i>candolleana</i>			
40.	11661 <i>Acacia drummondii</i> subsp. <i>drummondii</i>			
41.	11192 <i>Acacia drummondii</i> subsp. <i>elegans</i>			
42.	3320 <i>Acacia ephedroides</i>			
43.	3374 <i>Acacia huegelii</i>			
44.	11519 <i>Acacia lasiocarpa</i> var. <i>bracteolata</i>			
45.	15721 <i>Acacia lasiocarpa</i> var. <i>sedifolia</i>			
46.	15476 <i>Acacia latipes</i> subsp. <i>latipes</i>			
47.	3438 <i>Acacia meisneri</i>			
48.	3442 <i>Acacia microbotrya</i> (Manna Wattle, Kalyang)			
49.	3454 <i>Acacia nervosa</i> (Rib Wattle)			
50.	3496 <i>Acacia preissiana</i>			
51.	3502 <i>Acacia pulchella</i> (Prickly Moses)			
52.	15481 <i>Acacia pulchella</i> var. <i>glaberrima</i>			
53.	15483 <i>Acacia pulchella</i> var. <i>pulchella</i>			
54.	15480 <i>Acacia pulchella</i> var. <i>reflexa</i>			
55.	3515 <i>Acacia restiacea</i>			
56.	3527 <i>Acacia saligna</i> (Orange Wattle, Kudjong)			
57.	30033 <i>Acacia saligna</i> subsp. <i>lindleyi</i>			
58.	30032 <i>Acacia saligna</i> subsp. <i>saligna</i>			
59.	<i>Acacia</i> sp.			
60.	3554 <i>Acacia squamata</i>			
61.	3557 <i>Acacia stenoptera</i> (Narrow Winged Wattle)			
62.	3566 <i>Acacia subflexuosa</i>			Y
63.	16151 <i>Acacia subflexuosa</i> subsp. <i>subflexuosa</i>			
64.	3574 <i>Acacia teretifolia</i>			
65.	3591 <i>Acacia urophylla</i>			
66.	3602 <i>Acacia willdenowiana</i> (Grass Wattle)			
67.	7817 <i>Actinobole uliginosum</i> (Flannel Cudweed)			
68.	6205 <i>Actinotus leucocephalus</i> (Flannel Flower)			
69.	14970 <i>Adenanthos barbiger</i>			
70.	1775 <i>Adenanthos cygnorum</i> (Common Woollybush)			
71.	11837 <i>Adenanthos cygnorum</i> subsp. <i>cygnorum</i> (Common Woollybush)			
72.	23474 <i>Agrostocrinum hirsutum</i>			
73.	1261 <i>Agrostocrinum scabrum</i> (Blue Grass Lily)			
74.	23501 <i>Agrostocrinum scabrum</i> subsp. <i>scabrum</i>			
75.	185 <i>Aira cupaniana</i> (Silvery Hairgrass)	Y		
76.	1721 <i>Allocasuarina campestris</i>			
77.	1732 <i>Allocasuarina humilis</i> (Dwarf Sheoak)			
78.	1734 <i>Allocasuarina microstachya</i>			
79.	20755 <i>Alstroemeria psittacina</i>	Y		
80.	2652 <i>Alternanthera nodiflora</i> (Common Joyweed)			
81.	20197 <i>Amphipogon laguroides</i> subsp. <i>havellii</i>			
82.	2380 <i>Amyema miquelii</i> (Stalked Mistletoe)			
83.	2383 <i>Amyema preissii</i> (Wireleaf Mistletoe)			
84.	11470 <i>Anigozanthos bicolor</i> subsp. <i>bicolor</i>			
85.	1409 <i>Anigozanthos humilis</i> (Catspaw)			
86.	11434 <i>Anigozanthos humilis</i> subsp. <i>humilis</i>			
87.	11261 <i>Anigozanthos manglesii</i> subsp. <i>manglesii</i>			
88.	1116 <i>Aphelia brizula</i>			
89.	1264 <i>Arnocrinum preissii</i>			
90.	1201 <i>Asparagus officinalis</i> (Asparagus)	Y		
91.	4400 <i>Asterolasia pallida</i>			
92.	6323 <i>Astroloma ciliatum</i> (Candle Cranberry)			
93.	6324 <i>Astroloma compactum</i>			
94.	6326 <i>Astroloma epacridis</i>			
95.	6334 <i>Astroloma pallidum</i> (Kick Bush)			
96.	17237 <i>Austrostipa elegantissima</i>			
97.	17241 <i>Austrostipa hemipogon</i>			
98.	17254 <i>Austrostipa tenuifolia</i>			
99.	17257 <i>Austrostipa variabilis</i>			
100.	18279 <i>Babiana angustifolia</i>	Y		
101.	36441 <i>Babingtonia camphorosmae</i> (Camphor Myrtle)			
102.	32682 <i>Banksia armata</i> var. <i>armata</i>			

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103.	32683 <i>Banksia armata</i> var. <i>ignicida</i>			
104.	32677 <i>Banksia bipinnatifida</i>			
105.	32678 <i>Banksia bipinnatifida</i> subsp. <i>bipinnatifida</i>			
106.	32580 <i>Banksia dallanneyi</i> subsp. <i>dallanneyi</i> var. <i>dallanneyi</i>			
107.	32577 <i>Banksia dallanneyi</i> subsp. <i>dallanneyi</i> var. <i>melicula</i>			
108.	32560 <i>Banksia drummondii</i> subsp. <i>hiemalis</i>			
109.	32523 <i>Banksia fraseri</i> var. <i>fraseri</i>			
110.	1819 <i>Banksia grandis</i> (Bull <i>Banksia</i> , <i>Pulgarla</i> )			
111.	32518 <i>Banksia hewardiana</i>			
112.	32202 <i>Banksia nivea</i> ( <i>Honeypot Dryandra</i> , <i>Pudjarn</i> )			
113.	32203 <i>Banksia nivea</i> subsp. <i>nivea</i>			
114.	32200 <i>Banksia nobilis</i> subsp. <i>nobilis</i>			
115.	32142 <i>Banksia proteoides</i> ( <i>King Dryandra</i> )			
116.	32080 <i>Banksia sessilis</i> var. <i>sessilis</i>			
117.	12111 <i>Banksia sphaerocarpa</i> var. <i>sphaerocarpa</i> ( <i>Fox Banksia</i> )			
118.	32044 <i>Banksia squarrosa</i> ( <i>Pingle</i> )			
119.	32045 <i>Banksia squarrosa</i> subsp. <i>squarrosa</i>			
120.	32041 <i>Banksia stuposa</i>			
121.	32054 <i>Banksia undata</i> var. <i>undata</i>			
122.	740 <i>Baumea arthropphylla</i>			
123.	743 <i>Baumea juncea</i> ( <i>Bare Twigrush</i> )			
124.	744 <i>Baumea laxa</i>			
125.	747 <i>Baumea rubiginosa</i>			
126.	5385 <i>Beaufortia incana</i> ( <i>Grey-leaved Beaufortia</i> )			
127.	25788 <i>Billardiera fraseri</i> ( <i>Elegant Pronaya</i> )			
128.	25798 <i>Billardiera fusiformis</i> ( <i>Australian Bluebell</i> )			
129.	7856 <i>Blennospora drummondii</i>			
130.	4406 <i>Boronia busselliana</i>			
131.	4432 <i>Boronia ovata</i>			
132.	11381 <i>Boronia ramosa</i> subsp. <i>anethifolia</i>			
133.	11564 <i>Boronia ramosa</i> subsp. <i>ramosa</i>			
134.	16639 <i>Boronia scabra</i> subsp. <i>scabra</i>			
135.	4441 <i>Boronia spathulata</i> ( <i>Boronia</i> )			
136.	3710 <i>Bossiaea eriocarpa</i> ( <i>Common Brown Pea</i> )			
137.	3714 <i>Bossiaea ornata</i> ( <i>Broad Leaved Brown Pea</i> )			
138.	3717 <i>Bossiaea pulchella</i>			
139.	6341 <i>Brachyloma preissii</i> ( <i>Globe Heath</i> )			
140.	7875 <i>Brachyscome glandulosa</i>			
141.	7878 <i>Brachyscome iberidifolia</i>			
142.	2995 <i>Brassica x napus</i>	Y		
143.	244 <i>Briza maxima</i> ( <i>Blowfly Grass</i> )	Y		
144.	250 <i>Bromus hordeaceus</i> ( <i>Soft Brome</i> )	Y		
145.	1276 <i>Caesia micrantha</i> ( <i>Pale Grass Lily</i> )			
146.	11136 <i>Caladenia denticulata</i>			
147.	15348 <i>Caladenia flava</i> subsp. <i>flava</i>			
148.	44905 <i>Caladenia fluvialis</i>			
149.	15354 <i>Caladenia hirta</i> subsp. <i>hirta</i>			
150.	1603 <i>Caladenia longiclavata</i> ( <i>Clubbed Spider Orchid</i> )			
151.	15371 <i>Caladenia nana</i> subsp. <i>nana</i>			
152.	15377 <i>Caladenia reptans</i> subsp. <i>reptans</i>			
153.	15398 <i>Caladenia xantha</i>			
154.	2846 <i>Calandrinia calyptрата</i> ( <i>Pink Purslane</i> )			
155.	19309 <i>Calectasia narragara</i>			
156.	10861 <i>Callistachys lanceolata</i> ( <i>Wonnich</i> )			
157.	33157 <i>Calochilus stramenicola</i>			
158.	35816 <i>Calothamnus quadrifidus</i> subsp. <i>quadrifidus</i>			
159.	5429 <i>Calothamnus sanguineus</i> ( <i>Silky-leaved Blood flower, Pindak</i> )			
160.	5450 <i>Calytrix depressa</i>			
161.	5458 <i>Calytrix flavescens</i> ( <i>Summer Starflower</i> )			
162.	5461 <i>Calytrix glutinosa</i>			
163.	5481 <i>Calytrix sylvana</i>			
164.	5485 <i>Calytrix variabilis</i>			
165.	32338 <i>Campylopus introflexus</i>	Y		
166.	2948 <i>Cassytha aurea</i>			
167.	2952 <i>Cassytha glabella</i> ( <i>Tangled Dodder Laurel</i> )			
168.	11211 <i>Cassytha glabella</i> forma <i>dispar</i>			
169.	2957 <i>Cassytha racemosa</i> ( <i>Dodder Laurel</i> )			
170.	760 <i>Caustis dioica</i>			
171.	7916 <i>Centaurea melitensis</i> ( <i>Maltese Cockspur, Malta Thistle</i> )	Y		
172.	6542 <i>Centaureum tenuiflorum</i>	Y		

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173.	6214 <i>Centella asiatica</i>			
174.	7366 <i>Centranthus macrosiphon</i>	Y		
175.	1134 <i>Centrolepis polygyna</i> (Wiry Centrolepis)			
176.	<i>Cephalozziella hirta</i>			
177.	2889 <i>Cerastium glomeratum</i> (Mouse Ear Chickweed)	Y		
178.	1280 <i>Chamaescilla corymbosa</i> (Blue Squill)			
179.	11299 <i>Chamaescilla corymbosa</i> var. <i>corymbosa</i>			
180.	3169 <i>Cheiranthra preissiana</i>			
181.	271 <i>Chloris truncata</i> (Windmill Grass)			
182.	763 <i>Chorizandra enodis</i> (Black Bristlerush)			
183.	13111 <i>Chorizema aciculare</i> subsp. <i>laxum</i>			
184.	8971 <i>Chorizema cordatum</i>			
185.	3753 <i>Chorizema dicksonii</i> (Yellow-eyed Flame Pea)			
186.	48838 <i>Citrullus amarus</i>	Y		
187.	2929 <i>Clematis pubescens</i> (Common Clematis)			
188.	4550 <i>Comesperma calymega</i> (Blue-spike Milkwort)			
189.	4551 <i>Comesperma ciliatum</i>			
190.	1858 <i>Conospermum amoenum</i> (Blue Smokebush)			
191.	16856 <i>Conospermum amoenum</i> subsp. <i>cuneatum</i>			
192.	1866 <i>Conospermum densiflorum</i> (Crown Smokebush)			
193.	14876 <i>Conospermum densiflorum</i> subsp. <i>densiflorum</i>			
194.	1882 <i>Conospermum stoechadis</i> (Common Smokebush)			
195.	15611 <i>Conospermum stoechadis</i> subsp. <i>stoechadis</i> (Common Smokebush)			
196.	6349 <i>Conostephium preissii</i>			
197.	1418 <i>Conostylis aculeata</i> (Prickly Conostylis)			
198.	11552 <i>Conostylis aculeata</i> subsp. <i>bromelioides</i>			
199.	1420 <i>Conostylis androstemma</i> (Trumpets)			
200.	12035 <i>Conostylis caricina</i> subsp. <i>caricina</i>			
201.	1454 <i>Conostylis setigera</i> (Bristly Cottonhead)			
202.	11597 <i>Conostylis setigera</i> subsp. <i>setigera</i>			
203.	1455 <i>Conostylis setosa</i> (White Cottonhead)			
204.	17104 <i>Corymbia calophylla</i> (Marri)			
205.	13354 <i>Craspedia variabilis</i>			
206.	3136 <i>Crassula alata</i>	Y		
207.	17701 <i>Crassula closiana</i>			
208.	29054 <i>Crepis foetida</i> subsp. <i>foetida</i> (Stinking Hawksbeard)	Y		
209.	13470 <i>Cryptandra arbutiflora</i> var. <i>arbutiflora</i>			
210.	9076 <i>Cryptandra myriantha</i>			
211.	4804 <i>Cryptandra nutans</i>			
212.	48865 <i>Cucumis myriocarpus</i> subsp. <i>myriocarpus</i>	Y		
213.	1487 <i>Cyanella hyacinthoides</i>	Y		
214.	15114 <i>Cyanicula gemmata</i>			
215.	6750 <i>Cyanostegia lanceolata</i> (Tinsel Flower)			
216.	768 <i>Cyathochaeta avenacea</i>			
217.	40661 <i>Cycnogeton lineare</i>			
218.	19893 <i>Cynara cardunculus</i> subsp. <i>flavescens</i> (Artichoke Thistle, Wild Artichoke, Cardoon)	Y		
219.	815 <i>Cyperus tenellus</i> (Tiny Flatsedge)	Y		
220.	7420 <i>Dampiera alata</i> (Winged-stem Dampiera)			
221.	7451 <i>Dampiera lavandulacea</i>			
222.	7454 <i>Dampiera linearis</i> (Common Dampiera)			
223.	6960 <i>Datura ferox</i> (Fierce Thornapple)	Y		
224.	3793 <i>Daviesia angulata</i>			
225.	3799 <i>Daviesia cordata</i> (Bookleaf)			
226.	19747 <i>Daviesia decurrens</i> subsp. <i>decurrens</i>			
227.	11879 <i>Daviesia hakeoides</i> subsp. <i>hakeoides</i>			
228.	12326 <i>Daviesia hakeoides</i> subsp. <i>subnuda</i>			
229.	3815 <i>Daviesia horrida</i> (Prickly Bitter-pea)			
230.	3819 <i>Daviesia longifolia</i>			
231.	3832 <i>Daviesia physodes</i>			
232.	3835 <i>Daviesia preissii</i>			
233.	3839 <i>Daviesia rhombifolia</i>			
234.	17691 <i>Desmocladius fasciculatus</i>			
235.	299 <i>Deyeuxia quadriseta</i> (Reed Bentgrass)			
236.	1259 <i>Dianella revoluta</i> (Blueberry Lily)			
237.	1287 <i>Dichopogon capillipes</i>			
238.	1288 <i>Dichopogon fimbriatus</i> (Chocolate Lily)			
239.	20367 <i>Dillwynia laxiflora</i>			
240.	15268 <i>Diplolaena graniticola</i>			
241.	4746 <i>Diplopeltis huegelii</i>			
242.	18589 <i>Diplopeltis huegelii</i> subsp. <i>lehmannii</i>			

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243.	3011 <i>Diplotaxis muralis</i> (Wall Rocket)	Y		
244.	10791 <i>Diuris carinata</i> (Bee Orchid)			
245.	11049 <i>Diuris corymbosa</i>			
246.	1635 <i>Diuris longifolia</i> (Common Donkey Orchid)			
247.	46859 <i>Diuris ostrina</i>			
248.	15436 <i>Diuris porrifolia</i>			
249.	4775 <i>Dodonaea pinifolia</i>			
250.	11247 <i>Dodonaea viscosa</i> subsp. <i>angustissima</i>			
251.	15406 <i>Drakaea gracilis</i>			
252.	3092 <i>Drosera bulbosa</i> (Red-leaved Sundew)			
253.	13204 <i>Drosera callistos</i>			
254.	48724 <i>Drosera collina</i>			
255.	3095 <i>Drosera erythrorhiza</i> (Red Ink Sundew)			
256.	3097 <i>Drosera gigantea</i> (Giant Sundew)			
257.	3098 <i>Drosera glanduligera</i> (Pimpernel Sundew)			
258.	13197 <i>Drosera hyperostigma</i>			
259.	3106 <i>Drosera macrantha</i> (Bridal Rainbow)			
260.	3107 <i>Drosera macrophylla</i> (Showy Sundew)			
261.	3109 <i>Drosera menziesii</i> (Pink Rainbow)			
262.	49090 <i>Drosera</i> sp. <i>Branched styles</i> (S.C. Coffey 193)			
263.	13185 <i>Drosera pilos</i>			
264.	3131 <i>Drosera stolonifera</i> (Leafy Sundew)			
265.	3132 <i>Drosera stricticaulis</i> (Erect Sundew)			
266.	349 <i>Ehrharta longiflora</i> (Annual Veldt Grass)	Y		
267.	1644 <i>Elythranthera emarginata</i> (Pink Enamel Orchid)			
268.	376 <i>Eragrostis curvula</i> (African Lovegrass)	Y		
269.	379 <i>Eragrostis elongata</i> (Clustered Lovegrass)			
270.	415 <i>Eriachne ovata</i>			
271.	20718 <i>Ericksonella saccharata</i>			
272.	15413 <i>Eriochilus dilatatus</i> subsp. <i>undulatus</i>			
273.	4332 <i>Erodium botrys</i> (Long Storksbill)	Y		
274.	6219 <i>Eryngium pinnatifidum</i> (Blue Devils)			
275.	5545 <i>Eucalyptus accedens</i> (Powderbark Wandoo)			
276.	5616 <i>Eucalyptus decurva</i> (Slender Mallee)			
277.	5628 <i>Eucalyptus drummondii</i> (Drummond's Gum)			
278.	5673 <i>Eucalyptus horistes</i>			
279.	5690 <i>Eucalyptus lane-poolei</i> (Salmon White Gum)			
280.	11295 <i>Eucalyptus loxophleba</i> subsp. <i>loxophleba</i> (York Gum)			
281.	5708 <i>Eucalyptus marginata</i> (Jarrah, Djara)			
282.	13547 <i>Eucalyptus marginata</i> subsp. <i>marginata</i> (Jarrah)			
283.	13548 <i>Eucalyptus marginata</i> subsp. <i>thalassica</i> (Blue-leaved Jarrah)			
284.	5739 <i>Eucalyptus patens</i> (Swan River Blackbutt, Dwuda)			
285.	5763 <i>Eucalyptus rudis</i> (Flooded Gum, Kulurda)			
286.	12906 <i>Eucalyptus wandoo</i> subsp. <i>wandoo</i>			
287.	18392 <i>Freesia alba</i> x <i>leichtlinii</i>	Y		
288.	8365 <i>Fumaria bastardii</i>	Y		
289.	2969 <i>Fumaria capreolata</i> (Whiteflower Fumitory)	Y		
290.	901 <i>Gahnia australis</i>			
291.	7321 <i>Galium divaricatum</i>	Y		
292.	3895 <i>Gastrolobium calycinum</i> (York Road Poison)			
293.	20475 <i>Gastrolobium capitatum</i>			
294.	20516 <i>Gastrolobium cyanophyllum</i>			
295.	20513 <i>Gastrolobium dilatatum</i>			
296.	20473 <i>Gastrolobium ebracteolatum</i>			
297.	3899 <i>Gastrolobium epacridoides</i>			
298.	3905 <i>Gastrolobium hookeri</i>			
299.	3909 <i>Gastrolobium microcarpum</i> (Sandplain Poison)			
300.	10981 <i>Gastrolobium parviflorum</i>			
301.	3913 <i>Gastrolobium parvifolium</i> (Berry Poison)			
302.	19733 <i>Gastrolobium retusum</i>			
303.	3924 <i>Gastrolobium spinosum</i> (Prickly Poison)			
304.	3927 <i>Gastrolobium stowardii</i>			
305.	3933 <i>Gastrolobium villosum</i> (Crinkle-leaved Poison)			
306.	1520 <i>Gladiolus caryophyllaceus</i> (Wild Gladiolus)	Y		
307.	33620 <i>Glischrocaryon angustifolium</i>			
308.	6143 <i>Glischrocaryon aureum</i> (Common Popflower)			
309.	8002 <i>Gnephosis tenuissima</i>			
310.	19216 <i>Gompholobium cyaninum</i>			
311.	3950 <i>Gompholobium knightianum</i>			
312.	3951 <i>Gompholobium marginatum</i>			



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313.	3954 <i>Gompholobium polymorphum</i>			
314.	3955 <i>Gompholobium preissii</i>			
315.	3956 <i>Gompholobium shuttleworthii</i>			
316.	3957 <i>Gompholobium tomentosum</i> (Hairy Yellow Pea)			
317.	6149 <i>Gonocarpus cordiger</i>			
318.	6161 <i>Gonocarpus pithyoides</i>			
319.	29362 <i>Goodenia coerulea</i>			
320.	12520 <i>Goodenia fasciculata</i>			
321.	12551 <i>Goodenia micrantha</i>			
322.	7534 <i>Goodenia piniifolia</i> (Pine-leaved Goodenia)			
323.	7538 <i>Goodenia pulchella</i>			
324.	19285 <i>Goodenia pulchella</i> subsp. <i>Wheatbelt</i> (L.W. Sage & F. Hort 795)			
325.	14282 <i>Gratiola pubescens</i>			
326.	19628 <i>Grevillea bipinnatifida</i> subsp. <i>bipinnatifida</i>			
327.	13450 <i>Grevillea manglesii</i> subsp. <i>manglesii</i>			
328.	2066 <i>Grevillea pilulifera</i> (Woolly-flowered Grevillea)			
329.	2080 <i>Grevillea quercifolia</i> (Oak-leaf Grevillea)			
330.	18635 <i>Grevillea</i> sp. <i>Gunapin</i> (F. Hort 308)			
331.	2101 <i>Grevillea synapheae</i> (Catkin Grevillea)			
332.	14421 <i>Grevillea synapheae</i> subsp. <i>synapheae</i>			
333.	12824 <i>Grevillea vestita</i> subsp. <i>vestita</i>			
334.	2122 <i>Grevillea wilsonii</i> (Native Fuchsia)			
335.	2784 <i>Gyrostemon ramulosus</i> (Corkybark)			
336.	1465 <i>Haemodorum discolor</i>			
337.	1468 <i>Haemodorum laxum</i>			
338.	1470 <i>Haemodorum paniculatum</i> (Mardja)			
339.	1472 <i>Haemodorum simplex</i>			
340.	2149 <i>Hakea cristata</i> (Snail Hakea)			
341.	2164 <i>Hakea gilbertii</i>			
342.	2166 <i>Hakea incrassata</i> (Marble Hakea)			
343.	2175 <i>Hakea lissocarpha</i> (Honey Bush)			
344.	2176 <i>Hakea loranthifolia</i>			
345.	2179 <i>Hakea marginata</i>			
346.	45333 <i>Hakea neospathulata</i>			
347.	2197 <i>Hakea prostrata</i> (Harsh Hakea)			
348.	2203 <i>Hakea ruscifolia</i> (Candle Hakea)			
349.	2206 <i>Hakea stenocarpa</i> (Narrow-fruited Hakea)			
350.	2214 <i>Hakea trifurcata</i> (Two-leaf Hakea)			
351.	2215 <i>Hakea undulata</i> (Wavy-leaved Hakea)			
352.	2216 <i>Hakea varia</i> (Variable-leaved Hakea)			
353.	17485 <i>Halgania anagalloides</i>			
354.	6710 <i>Heliotropium europaeum</i> (Common Heliotrope)	Y		
355.	439 <i>Hemarthria uncinata</i> (Matgrass)			
356.	6838 <i>Hemiantra linearis</i> (Speckled Snakebush)			
357.	6839 <i>Hemiantra pungens</i> (Snakebush)			
358.	38320 <i>Hemiantra</i> sp. <i>Jurien</i> (B.J. Conn & M.E. Tozer BJC 3885)			
359.	6842 <i>Hemigenia barbata</i>			
360.	6856 <i>Hemigenia incana</i> (Silky Hemigenia)			
361.	29632 <i>Hemigenia parviflora</i>			
362.	1526 <i>Hesperantha falcata</i>	Y		
363.	5114 <i>Hibbertia commutata</i>			
364.	20051 <i>Hibbertia diamesogenos</i>			
365.	20046 <i>Hibbertia hibbertioides</i> var. <i>hibbertioides</i>			
366.	5134 <i>Hibbertia huegelii</i>			
367.	45534 <i>Hibbertia hypericoides</i> subsp. <i>hypericoides</i>			
368.	5139 <i>Hibbertia lasiopus</i> (Large Hibbertia)			
369.	5152 <i>Hibbertia ovata</i>			
370.	5172 <i>Hibbertia stellaris</i> (Orange Stars)			
371.	5173 <i>Hibbertia subvaginata</i>			
372.	445 <i>Holcus setiger</i> (Annual Fog)	Y		
373.	6222 <i>Homalosciadium homalocarpum</i>			
374.	3964 <i>Hovea chorizemifolia</i> (Holly-leaved Hovea)			
375.	3966 <i>Hovea pungens</i> (Devil's Pins, Puyenak)			
376.	3968 <i>Hovea trisperma</i> (Common Hovea)			
377.	12741 <i>Hyalosperma cotula</i>			
378.	16759 <i>Hyalosperma simplex</i> subsp. <i>simplex</i>			
379.	12007 <i>Hybanthus floribundus</i> subsp. <i>floribundus</i>			
380.	6226 <i>Hydrocotyle callicarpa</i> (Small Pennywort)			
381.	5817 <i>Hypocalymma angustifolium</i> (White Myrtle, Kudjid)			
382.	8086 <i>Hypochaeris glabra</i> (Smooth Catsear)	Y		

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383.	20199 <i>Isolepis cernua</i> var. <i>cernua</i>			
384.	912 <i>Isolepis cyperoides</i>			
385.	917 <i>Isolepis marginata</i> (Coarse Club-rush)			
386.	2227 <i>Isopogon divergens</i> (Spreading Coneflower)			
387.	2229 <i>Isopogon dubius</i> (Pincushion Coneflower)			
388.	19996 <i>Isopogon</i> sp. Darling Range (F. Hort 1662)			
389.	7396 <i>Isotoma hypoc crateriformis</i> (Woodbridge Poison)			
390.	7399 <i>Isotoma scapigera</i> (Long-scaped Isotome)			
391.	19700 <i>Isotropis cuneifolia</i> subsp. <i>cuneifolia</i>			
392.	1532 <i>Ixia maculata</i> (Yellow Ixia)	Y		
393.	14739 <i>Jacksonia epiphyllum</i>			
394.	4010 <i>Jacksonia floribunda</i> (Holly Pea)			
395.	4012 <i>Jacksonia furcellata</i> (Grey Stinkwood)			
396.	4025 <i>Jacksonia restioides</i>			
397.	4029 <i>Jacksonia sternbergiana</i> (Stinkwood, Kapur)			
398.	1175 <i>Juncus acutus</i> (Spiny Rush)	Y		
399.	1178 <i>Juncus bufonius</i> (Toad Rush)	Y		
400.	1180 <i>Juncus capitatus</i> (Capitate Rush)	Y		
401.	1195 <i>Juncus subsecundus</i> (Finger Rush)			
402.	4037 <i>Kennedia coccinea</i> (Coral Vine)			
403.	4044 <i>Kennedia prostrata</i> (Scarlet Runner)			
404.	4045 <i>Kennedia stirlingii</i> (Bushy Kennedia)			
405.	12008 <i>Kickxia elatine</i> subsp. <i>crinita</i>	Y		
406.	1221 <i>Kingia australis</i> (Kingia, Pulonok)			
407.	17505 <i>Kunzea praestans</i>			
408.	11289 <i>Labichea lanceolata</i> subsp. <i>lanceolata</i>			
409.	3669 <i>Labichea punctata</i> (Lance-leaved Cassia)			
410.	6781 <i>Lachnostachys ferruginea</i> (Rusty Lambstail)			
411.	18585 <i>Lagenophora huegelii</i>			
412.	14083 <i>Lambertia multiflora</i> var. <i>darlingensis</i>			
413.	45082 <i>Lasiopetalum glutinosum</i> subsp. <i>latifolium</i>			
414.	1303 <i>Laxmannia grandiflora</i>			
415.	11815 <i>Laxmannia grandiflora</i> subsp. <i>grandiflora</i>			
416.	11911 <i>Laxmannia ramosa</i> subsp. <i>ramosa</i>			
417.	11464 <i>Laxmannia sessiliflora</i> subsp. <i>australis</i>			
418.	1309 <i>Laxmannia squarrosa</i>			
419.	7568 <i>Lechenaultia biloba</i> (Blue Leschenaultia)			
420.	7572 <i>Lechenaultia expansa</i>			
421.	1075 <i>Lepidobolus preissianus</i>			
422.	18074 <i>Lepidobolus preissianus</i> subsp. <i>preissianus</i>			
423.	936 <i>Lepidosperma leptostachyum</i>			
424.	937 <i>Lepidosperma longitudinale</i> (Pithy Sword-sedge)			
425.	14642 <i>Lepidosperma obtusum</i>			
426.	944 <i>Lepidosperma scabrum</i>			
427.	<i>Lepidosperma</i> sp.			
428.	16284 <i>Lepidosperma</i> sp. P1 small head (M.D. Tindale 166A)			
429.	945 <i>Lepidosperma squamatum</i>			
430.	1077 <i>Leptocarpus canus</i> (Hoary Twine-rush)			
431.	1078 <i>Leptocarpus coangustatus</i>			
432.	46375 <i>Leptocarpus decipiens</i>			
433.	19833 <i>Leptocarpus laxus</i>			
434.	15418 <i>Leptoceras menziesii</i>			
435.	2342 <i>Leptomeria cunninghamii</i>			
436.	5847 <i>Leptospermum erubescens</i> (Roadside Teatree)			
437.	6367 <i>Leucopogon capitellatus</i>			
438.	6416 <i>Leucopogon nutans</i> (Drooping Leucopogon)			
439.	6425 <i>Leucopogon oxycedrus</i>			
440.	6436 <i>Leucopogon propinquus</i>			
441.	6438 <i>Leucopogon pubescens</i>			
442.	6439 <i>Leucopogon pulchellus</i> (Beard-heath)			
443.	6444 <i>Leucopogon sprengeioides</i>			
444.	7676 <i>Levenhookia pusilla</i> (Midget Stylewort)			
445.	7677 <i>Levenhookia stipitata</i> (Common Stylewort)			
446.	9289 <i>Lobelia anceps</i> (Angled Lobelia)			
447.	31877 <i>Lobelia cleistogamoides</i>			
448.	1223 <i>Lomandra caespitosa</i> (Tufted Mat Rush)			
449.	1226 <i>Lomandra effusa</i> (Scented Matrush)			
450.	1228 <i>Lomandra hermaphrodita</i>			
451.	14542 <i>Lomandra micrantha</i> subsp. <i>micrantha</i>			
452.	1236 <i>Lomandra odora</i> (Tiered Matrush)			

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453.	<i>Lomandra</i> sp.			
454.	1245 <i>Lomandra spartea</i>			
455.	15835 <i>Loxocarya striata</i>			
456.	18119 <i>Macrozamia fraseri</i>			
457.	85 <i>Macrozamia riedlei</i> ( <i>Zamia</i> , <i>Djiridji</i> )			
458.	19421 <i>Marianthus bicolor</i> ( <i>Painted Marianthus</i> )			
459.	17636 <i>Marianthus coeruleopunctatus</i> ( <i>Blue-spotted Marianthus</i> )			
460.	5876 <i>Melaleuca aspalathoides</i>			
461.	5919 <i>Melaleuca holosericea</i>			
462.	5921 <i>Melaleuca incana</i> ( <i>Grey Honeymyrtle</i> )			
463.	5926 <i>Melaleuca lateritia</i> ( <i>Robin Redbreast Bush</i> )			
464.	5952 <i>Melaleuca preissiana</i> ( <i>Moonah</i> )			
465.	5959 <i>Melaleuca rhapsiophylla</i> ( <i>Swamp Paperbark</i> )			
466.	5980 <i>Melaleuca thymoides</i>			
467.	13280 <i>Melaleuca viminea</i> subsp. <i>viminea</i>			
468.	4085 <i>Melilotus indicus</i>	Y		
469.	957 <i>Mesomelaena tetragona</i> ( <i>Semaphore Sedge</i> )			
470.	6891 <i>Microcorys ericifolia</i>			
471.	485 <i>Microlaena stipoides</i> ( <i>Weeping Grass</i> )			
472.	1660 <i>Microtis orbicularis</i> ( <i>Dark Mignonette Orchid</i> )			
473.	8105 <i>Millotia myosotidifolia</i>			
474.	8106 <i>Millotia tenuifolia</i> ( <i>Soft Millotia</i> )			
475.	14344 <i>Millotia tenuifolia</i> var. <i>tenuifolia</i> ( <i>Soft Millotia</i> )			
476.	37440 <i>Monopsis debilis</i> var. <i>depressa</i>	Y		
477.	19585 <i>Monotaxis grandiflora</i> var. <i>grandiflora</i>			
478.	1535 <i>Moraea fugax</i>	Y		
479.	19180 <i>Moraea miniata</i> ( <i>Two-leaf Cape Tulip</i> )	Y		
480.	2412 <i>Muehlenbeckia adpressa</i> ( <i>Climbing Lignum</i> )			
481.	6199 <i>Myriophyllum tillaeoides</i>			
482.	11019 <i>Narcissus papyraceus</i>	Y		
483.	44496 <i>Narcissus tazetta</i> subsp. <i>italicus</i>	Y		
484.	44495 <i>Narcissus tazetta</i> subsp. <i>tazetta</i>	Y		
485.	492 <i>Neurachne alopecuroidea</i> ( <i>Foxtail Mulga Grass</i> )			
486.	2365 <i>Olax benthamiana</i>			
487.	8127 <i>Olearia axillaris</i> ( <i>Coastal Daisybush</i> )			
488.	8133 <i>Olearia elaeophila</i>			
489.	8143 <i>Olearia paucidentata</i> ( <i>Autumn Scrub Daisy</i> )			
490.	18255 <i>Opercularia vaginata</i> ( <i>Dog Weed</i> )			
491.	36177 <i>Ornduffia albiflora</i>			
492.	11442 <i>Orthrosanthus laxus</i> var. <i>gramineus</i> ( <i>Grass-leaved Orthrosanthus</i> )			
493.	30375 <i>Oxalis exilis</i>			
494.	4351 <i>Oxalis flava</i> ( <i>Pinkbulb Soursob</i> )	Y		
495.	4358 <i>Oxalis purpurea</i> ( <i>Largeflower Wood Sorrel</i> )	Y		
496.	2965 <i>Papaver rhoeas</i> ( <i>Field Poppy</i> )	Y		
497.	15423 <i>Paracaleana triens</i>			
498.	3618 <i>Paraserianthes lophantha</i> ( <i>Albizia</i> )			
499.	17114 <i>Paraserianthes lophantha</i> subsp. <i>lophantha</i>			
500.	5225 <i>Passiflora filamentosa</i>	Y		
501.	1546 <i>Patersonia juncea</i> ( <i>Rush Leaved Patersonia</i> )			
502.	1552 <i>Patersonia rudis</i> ( <i>Hairy Flag</i> )			
503.	14433 <i>Patersonia rudis</i> subsp. <i>rudis</i>			
504.	43765 <i>Pauridia glabella</i> var. <i>glabella</i>			
505.	6245 <i>Pentapeltis peltigera</i>			
506.	11052 <i>Persicaria prostrata</i>			
507.	2255 <i>Persoonia angustiflora</i>			
508.	2262 <i>Persoonia elliptica</i> ( <i>Spreading Snottygobble</i> )			
509.	2270 <i>Persoonia quinquenervis</i>			
510.	2284 <i>Petrophile biloba</i> ( <i>Granite Petrophile</i> )			
511.	2297 <i>Petrophile heterophylla</i> ( <i>Variable-leaved Cone Bush</i> )			
512.	2308 <i>Petrophile seminuda</i>			
513.	2309 <i>Petrophile serruriae</i>			
514.	2312 <i>Petrophile striata</i>			
515.	20460 <i>Pheladenia deformis</i>			
516.	18531 <i>Philothea nodiflora</i> subsp. <i>calycina</i>			
517.	18534 <i>Philothea nodiflora</i> subsp. <i>nodiflora</i>			
518.	18529 <i>Philothea spicata</i> ( <i>Pepper and Salt</i> )			
519.	1173 <i>Philydrella pygmaea</i> ( <i>Butterfly Flowers</i> )			
520.	16177 <i>Phyllangium paradoxum</i>			
521.	4675 <i>Phyllanthus calycinus</i> ( <i>False Boronia</i> )			
522.	13405 <i>Phyllopodium cordatum</i>	Y		

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523.	2408 <i>Ptilostyles hamiltonii</i>			
524.	5231 <i>Pimelea angustifolia</i> (Narrow-leaved Pimelea)			
525.	5232 <i>Pimelea argentea</i> (Silvery Leaved Pimelea)			
526.	11928 <i>Pimelea ciliata</i> subsp. <i>ciliata</i>			
527.	11402 <i>Pimelea imbricata</i> var. <i>piligera</i>			
528.	5259 <i>Pimelea preissii</i>			
529.	12041 <i>Pimelea suaveolens</i> subsp. <i>suaveolens</i>			
530.	5269 <i>Pimelea sylvestris</i>			
531.	18353 <i>Pithocarpa pulchella</i> var. <i>pulchella</i>			
532.	6260 <i>Platysace teres</i>			
533.	86 <i>Podocarpus drouynianus</i> (Wild Plum, Kula)			
534.	45237 <i>Podolepis aristata</i> subsp. <i>aristata</i>			
535.	8175 <i>Podolepis gracilis</i> (Slender Podolepis)			
536.	8179 <i>Podolepis nutans</i> (Nodding Podolepis)			
537.	8188 <i>Pogonolepis stricta</i>			
538.	2905 <i>Polycarpon tetraphyllum</i> (Fourleaf Allseed)	Y		
539.	8395 <i>Polygala myrtifolia</i> (Myrtleleaf Milkwort)	Y		
540.	4691 <i>Poranthera microphylla</i> (Small Poranthera)			
541.	111 <i>Potamogeton ochreateus</i> (Blunt Pondweed)			
542.	1670 <i>Prasophyllum drummondii</i> (Swamp Leek Orchid)			
543.	1671 <i>Prasophyllum elatum</i> (Tall Leek Orchid)			
544.	16688 <i>Prasophyllum gracile</i>			
545.	1676 <i>Prasophyllum hians</i> (Yawning Leek Orchid)			
546.	13255 <i>Pterochaeta paniculata</i>			
547.	10870 <i>Pterostylis ciliata</i>			
548.	10875 <i>Pterostylis concava</i>			
549.	1693 <i>Pterostylis recurva</i> (Jug Orchid)			
550.	12217 <i>Pterostylis sanguinea</i>			
551.	18655 <i>Pterostylis</i> sp. <i>crinkled leaf</i> (G.J. Keighery 13426)			
552.	1698 <i>Pterostylis vittata</i> (Banded Greenhood)			
553.	2716 <i>Ptilotus declinatus</i> (Curved Mulla Mulla)			
554.	2718 <i>Ptilotus drummondii</i> (Narrowleaf Mulla Mulla)			
555.	11260 <i>Ptilotus drummondii</i> var. <i>drummondii</i> (Pussytail)			
556.	2742 <i>Ptilotus manglesii</i> (Pom Poms, Mulamula)			
557.	32417 <i>Ptychostomum angustifolium</i>			
558.	16367 <i>Pyrorchis nigricans</i> (Red beaks, Elephants ears)			
559.	13300 <i>Rhodanthe citrina</i>			
560.	15035 <i>Rhodanthe corymbosa</i>			
561.	19942 <i>Ricinocarpos undulatus</i>			
562.	1556 <i>Romulea rosea</i> (Guildford Grass)	Y		
563.	40431 <i>Rytidosperma acerosum</i>			
564.	40425 <i>Rytidosperma caespitosum</i>			
565.	40426 <i>Rytidosperma occidentale</i>			
566.	6929 <i>Salvia verbenaca</i> (Wild Sage)	Y		
567.	6483 <i>Samolus junceus</i>			
568.	7602 <i>Scaevola calliptera</i>			
569.	7613 <i>Scaevola glandulifera</i> (Viscid Hand-flower)			
570.	7619 <i>Scaevola lanceolata</i> (Long-leaved Scaevola)			
571.	7635 <i>Scaevola pilosa</i> (Hairy Fan-flower)			
572.	7636 <i>Scaevola platyphylla</i> (Broad-leaved Fanflower)			
573.	13182 <i>Scaevola repens</i> var. <i>repens</i>			
574.	975 <i>Schoenus bifidus</i>			
575.	979 <i>Schoenus caespititius</i>			
576.	984 <i>Schoenus curvifolius</i>			
577.	1002 <i>Schoenus nanus</i> (Tiny Bog Rush)			
578.	1004 <i>Schoenus nitens</i> (Shiny Bog-rush)			
579.	1018 <i>Schoenus subfascicularis</i>			
580.	17409 <i>Schoenus variicellae</i>			
581.	6 <i>Selaginella gracillima</i> (Tiny Clubmoss)			
582.	20663 <i>Senecio multicaulis</i> subsp. <i>multicaulis</i>			
583.	20161 <i>Senecio pinnatifolius</i>			
584.	8224 <i>Siloxerus filifolius</i>			
585.	8225 <i>Siloxerus humifusus</i> (Procumbent Siloxerus)			
586.	14583 <i>Siloxerus multiflorus</i>			
587.	7013 <i>Solanum hoplopetalum</i> (Thorny Solanum)			
588.	8230 <i>Sonchus asper</i> (Rough Sowthistle)	Y		
589.	35236 <i>Sorghum x drummondii</i> (Sudan Grass)	Y		
590.	2912 <i>Spergula arvensis</i> (Corn Spurry)	Y		
591.	4207 <i>Sphaerolobium medium</i>			
592.	4211 <i>Sphaerolobium vimineum</i> (Leafless Globe Pea)			

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593.	6930 <i>Stachys arvensis</i> (Staggerweed)	Y		
594.	13473 <i>Stenanthemum coronatum</i>			
595.	16198 <i>Stenanthemum intricatum</i>			
596.	7681 <i>Stylidium affine</i> (Queen Triggerplant)			
597.	7684 <i>Stylidium amoenum</i> (Lovely Triggerplant)			
598.	30278 <i>Stylidium androsaceum</i>			
599.	48457 <i>Stylidium bindoon</i>			
600.	7702 <i>Stylidium ciliatum</i> (Golden Triggerplant)			
601.	7708 <i>Stylidium crassifolium</i> (Thick-leaved Triggerplant)			
602.	7710 <i>Stylidium cygnorum</i>			
603.	7713 <i>Stylidium dichotomum</i> (Pins-and-needles)			
604.	7716 <i>Stylidium diuroides</i> (Donkey Triggerplant)			
605.	11808 <i>Stylidium diuroides</i> subsp. <i>diuroides</i>			
606.	7721 <i>Stylidium emarginatum</i> (Biddy-four-legs)			
607.	19251 <i>Stylidium eriopodium</i>			
608.	7736 <i>Stylidium hispidum</i> (White Butterfly Triggerplant)			
609.	7742 <i>Stylidium inundatum</i> (Hundreds and Thousands)			
610.	13083 <i>Stylidium lateriticola</i>			
611.	7749 <i>Stylidium leptophyllum</i> (Needle-leaved Triggerplant)			
612.	7773 <i>Stylidium petiolare</i> (Horn Triggerplant)			
613.	7774 <i>Stylidium piliferum</i> (Common Butterfly Triggerplant)			
614.	7781 <i>Stylidium pubigerum</i> (Yellow Butterfly Triggerplant)			
615.	7783 <i>Stylidium pycnostachyum</i> (Downy Triggerplant)			
616.	33106 <i>Stylidium recurvum</i>			
617.	7785 <i>Stylidium repens</i> (Matted Triggerplant)			
618.	7787 <i>Stylidium rhynchocarpum</i> (Black-beaked Triggerplant)			
619.	7790 <i>Stylidium roseoalatum</i> (Pink-wing Triggerplant)			
620.	25806 <i>Stylidium scariosum</i>			
621.	7798 <i>Stylidium schoenoides</i> (Cow Kicks)			
622.	<i>Stylidium</i> sp.			
623.	45594 <i>Stylidium tenue</i> subsp. <i>majusculum</i> (Showy Fountain Triggerplant)			
624.	45593 <i>Stylidium tenue</i> subsp. <i>tenue</i> (Little Fountain Triggerplant)			
625.	23511 <i>Stylidium thesioides</i> (Delicate Triggerplant)			
626.	7806 <i>Stylidium utricularioides</i> (Pink Fan Triggerplant)			
627.	40947 <i>Stylidium xanthellum</i>			
628.	1260 <i>Stypandra glauca</i> (Blind Grass)			
629.	6476 <i>Styphelia tenuiflora</i> (Common Pinheath)			
630.	12914 <i>Synaphea decorticans</i>			
631.	2323 <i>Synaphea gracillima</i>			
632.	29186 <i>Synaphea</i> sp. <i>Udumung</i> (A.S. George 17058)			
633.	4251 <i>Templetonia drummondii</i>			
634.	46437 <i>Tetrapora preissiana</i>			
635.	1036 <i>Tetradia octandra</i>			
636.	4528 <i>Tetradthea confertifolia</i>			
637.	4535 <i>Tetradthea hirsuta</i> (Black Eyed Susan)			
638.	48342 <i>Tetradthea hirsuta</i> subsp. <i>hirsuta</i>			
639.	48341 <i>Tetradthea hirsuta</i> subsp. <i>viminea</i>			
640.	4537 <i>Tetradthea nuda</i>			
641.	4546 <i>Tetradthea virgata</i>			
642.	10856 <i>Thelymitra benthamiana</i> (Leopard Orchid)			
643.	673 <i>Themeda triandra</i>			
644.	5080 <i>Thomasia foliosa</i>			
645.	5086 <i>Thomasia macrocalyx</i>			
646.	1328 <i>Thysanotus dichotomus</i> (Branching Fringe Lily)			
647.	1339 <i>Thysanotus multiflorus</i> (Many-flowered Fringe Lily)			
648.	1343 <i>Thysanotus patersonii</i>			
649.	1351 <i>Thysanotus sparteus</i>			
650.	1357 <i>Thysanotus thyrsoides</i>			
651.	1358 <i>Thysanotus triandrus</i>			
652.	6268 <i>Trachymene cyanopetala</i>			
653.	6280 <i>Trachymene pilosa</i> (Native Parsnip)			
654.	1483 <i>Tribonanthes longipetala</i> (Branching Tiurmdin)			
655.	8251 <i>Trichocline spathulata</i> (Native Gerbera)			
656.	1361 <i>Tricoryne elatior</i> (Yellow Autumn Lily)			
657.	1362 <i>Tricoryne humilis</i>			
658.	4313 <i>Trifolium subterraneum</i> (Subterranean Clover)	Y		
659.	4737 <i>Tripterococcus brunonis</i> (Winged Stackhousia)			
660.	1139 <i>Trithuria bibracteata</i>			
661.	4839 <i>Trymalium angustifolium</i>			
662.	4842 <i>Trymalium ledifolium</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
663.	15144 <i>Trymalium ledifolium</i> var. <i>lineare</i>			
664.	13479 <i>Trymalium ledifolium</i> var. <i>rosmarinifolium</i>			
665.	33418 <i>Trymalium odoratissimum</i> subsp. <i>odoratissimum</i>			
666.	99 <i>Typha orientalis</i> (Bulrush, Cumbungi)			
667.	38388 <i>Ursinia anthemoides</i> subsp. <i>anthemoides</i>	Y		
668.	7148 <i>Utricularia multifida</i>			
669.	7158 <i>Utricularia volubilis</i> (Twining Bladderwort)			
670.	7665 <i>Velleia trinervis</i>			
671.	8257 <i>Vellereophyton dealbatum</i> (White Cudweed)	Y		
672.	7666 <i>Verreauxia reinwardtii</i> (Common Verreauxia)			
673.	12388 <i>Verticordia acerosa</i> var. <i>preissii</i>			
674.	6082 <i>Verticordia grandiflora</i> (Claw Featherflower)			
675.	15433 <i>Verticordia huegelii</i> var. <i>huegelii</i>			
676.	12430 <i>Verticordia huegelii</i> var. <i>stylosa</i>			
677.	15434 <i>Verticordia insignis</i> subsp. <i>insignis</i>			
678.	6107 <i>Verticordia pennigera</i>			
679.	6109 <i>Verticordia picta</i> (Painted Featherflower)			
680.	15618 <i>Verticordia plumosa</i> var. <i>plumosa</i>			
681.	4325 <i>Viminaria juncea</i> (Swishbush, Koweda)			
682.	12052 <i>Vulpia myuros</i> forma <i>megalura</i>	Y		
683.	7386 <i>Wahlenbergia gracilentia</i> (Annual Bluebell)			
684.	7388 <i>Wahlenbergia multicaulis</i>			
685.	13328 <i>Waitzia nitida</i>			
686.	8281 <i>Waitzia podolepis</i>			
687.	12072 <i>Wurmbea dioica</i> subsp. <i>alba</i>			
688.	1252 <i>Xanthorrhoea drummondii</i>			
689.	1253 <i>Xanthorrhoea gracilis</i> (Graceful Grass Tree, Mimidi)			
690.	1256 <i>Xanthorrhoea preissii</i> (Grass tree, Palga)			
691.	6283 <i>Xanthosia atkinsoniana</i>			
692.	6284 <i>Xanthosia candida</i>			
693.	6285 <i>Xanthosia ciliata</i>			
694.	6289 <i>Xanthosia huegelii</i>			
695.	6293 <i>Xanthosia singuliflora</i>			
696.	44861 <i>Xerochrysum macranthum</i>			

**Conservation Codes**

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

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



# EPBC Act Protected Matters Report

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

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

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

Report created: 29/01/20 15:32:40

[Summary](#)

[Details](#)

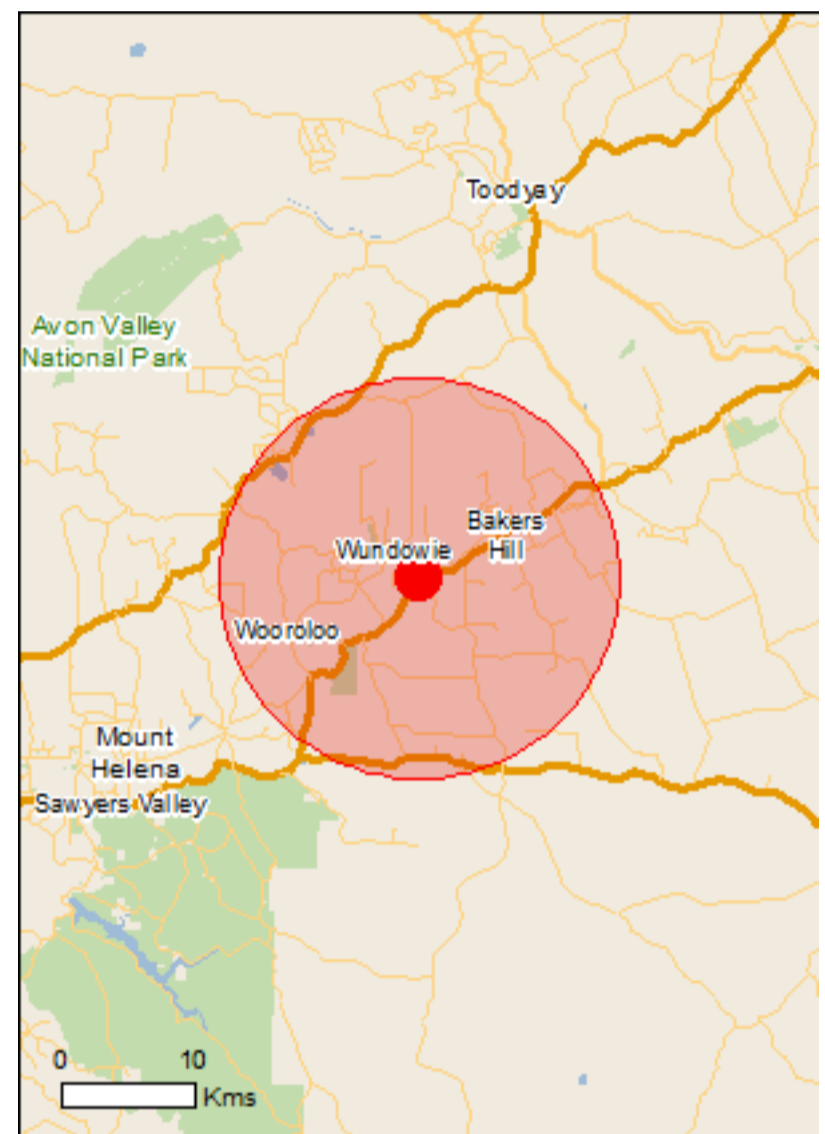
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

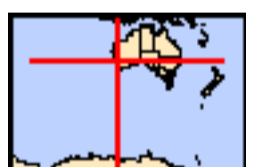
[Acknowledgements](#)



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[Coordinates](#)

[Buffer: 15.0Km](#)



# Summary

## Matters of National Environmental Significance

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

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	1
<a href="#">Wetlands of International Importance:</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	1
<a href="#">Listed Threatened Species:</a>	25
<a href="#">Listed Migratory Species:</a>	9

## Other Matters Protected by the EPBC Act

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

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

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

<a href="#">Commonwealth Land:</a>	1
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	15
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	12
<a href="#">Regional Forest Agreements:</a>	1
<a href="#">Invasive Species:</a>	32
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">Key Ecological Features (Marine)</a>	None



# Details

## Matters of National Environmental Significance

National Heritage Properties		[ Resource Information ]
Name	State	Status
Historic		
<a href="#">Goldfields Water Supply Scheme, Western Australia</a>	WA	Listed place

## Listed Threatened Ecological Communities

[ Resource Information ]

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

Name	Status	Type of Presence
<a href="#">Eucalypt Woodlands of the Western Australian Wheatbelt</a>	Critically Endangered	Community likely to occur within area

## Listed Threatened Species

[ Resource Information ]

Name	Status	Type of Presence
Birds		

<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
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<a href="#">Calyptorhynchus banksii naso</a> Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area
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<a href="#">Calyptorhynchus baudinii</a> Baudin's Cockatoo, Long-billed Black-Cockatoo [769]	Endangered	Roosting known to occur within area
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<a href="#">Calyptorhynchus latirostris</a> Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
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<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
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<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
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<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
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## Mammals

<a href="#">Bettongia penicillata ogilbyi</a> Woylie [66844]	Endangered	Species or species habitat likely to occur within area
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<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area
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<a href="#">Petrogale lateralis lateralis</a> Black-flanked Rock-wallaby, Moororong, Black-footed Rock Wallaby [66647]	Endangered	Species or species habitat likely to occur
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Name	Status	Type of Presence within area
<a href="#">Phascogale calura</a> Red-tailed Phascogale, Red-tailed Wambenger, Kenngoor [316]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Setonix brachyurus</a> Quokka [229]	Vulnerable	Species or species habitat may occur within area
<b>Other</b>		
<a href="#">Idiosoma nigrum</a> Shield-backed Trapdoor Spider, Black Rugose Trapdoor Spider [66798]	Vulnerable	Species or species habitat may occur within area
<a href="#">Westralunio carteri</a> Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat may occur within area
<b>Plants</b>		
<a href="#">Acacia aphylla</a> Leafless Rock Wattle [13553]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Anthocercis gracilis</a> Slender Tailflower [11103]	Vulnerable	Species or species habitat may occur within area
<a href="#">Caladenia huegelii</a> King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area
<a href="#">Diplolaena andrewsii</a> [6601]	Endangered	Species or species habitat may occur within area
<a href="#">Diuris micrantha</a> Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat may occur within area
<a href="#">Diuris purdiei</a> Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area
<a href="#">Eleocharis keigheryi</a> Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat may occur within area
<a href="#">Eucalyptus recta</a> Silver Mallet [56430]	Endangered	Species or species habitat likely to occur within area
<a href="#">Thelymitra dedmaniarum</a> Cinnamon Sun Orchid [65105]	Endangered	Species or species habitat likely to occur within area
<a href="#">Thelymitra stellata</a> Star Sun-orchid [7060]	Endangered	Species or species habitat likely to occur within area
<a href="#">Verticordia fimbrialepis subsp. fimbrialepis</a> Shy Featherflower [24631]	Endangered	Species or species habitat may occur within area

#### Listed Migratory Species

[ [Resource Information](#) ]

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

Name	Threatened	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
<b>Migratory Terrestrial Species</b>		
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<b>Migratory Wetlands Species</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat may occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

## Other Matters Protected by the EPBC Act

### Commonwealth Land [\[ Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -

### Listed Marine Species [\[ Resource Information \]](#)

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

Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Chrysococcyx osculans</a> Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat may occur within area
<a href="#">Rostratula benghalensis (sensu lato)</a> Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

## Extra Information

### State and Territory Reserves [\[ Resource Information \]](#)

Name	State
Beechina	WA
Beechina North	WA
Clackline	WA
Inkpen Road	WA
Keaginine	WA
Kwolyinine	WA
Morangup	WA
Needham	WA
Unnamed WA30393	WA
Wandoo	WA
Woondowing	WA
Woottating	WA

### Regional Forest Agreements [\[ Resource Information \]](#)

Note that all areas with completed RFAs have been included.

Name	State
<a href="#">South West WA RFA</a>	Western Australia

### Invasive Species [\[ Resource Information \]](#)

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

Name	Status	Type of Presence
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Name	Status	Type of Presence
<b>Birds</b>		
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Cygnus olor Mute Swan [962]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
<b>Mammals</b>		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
<p>Sus scrofa Pig [6]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Vulpes vulpes Red Fox, Fox [18]</p>		<p>Species or species habitat likely to occur within area</p>
<b>Plants</b>		
<p>Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Carrichtera annua Ward's Weed [9511]</p>		<p>Species or species habitat may occur within area</p>
<p>Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]</p>		<p>Species or species habitat may occur within area</p>
<p>Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]</p>		<p>Species or species habitat may occur within area</p>
<p>Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Genista sp. X Genista monspessulana Broom [67538]</p>		<p>Species or species habitat may occur within area</p>
<p>Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Lycium ferocissimum African Boxthorn, Boxthorn [19235]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]</p>		<p>Species or species habitat may occur within area</p>
<p>Rubus fruticosus aggregate Blackberry, European Blackberry [68406]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]</p>		<p>Species or species habitat likely to occur within area</p>

# Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

# Coordinates

-31.77278 116.40046

# Acknowledgements

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

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

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

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



# **Appendix B Flora Inventory**

Family	Species
Amaranthaceae	<i>Ptilotus manglesii</i>
Apiaceae	* <i>Foeniculum vulgare</i>
	<i>Xanthosia candida</i>
Apocynaceae	* <i>Vinca major</i>
Araceae	* <i>Zantedeschia aethiopica</i>
Araliaceae	<i>Trachymene pilosa</i>
Asparagaceae	* <i>Asparagus asparagoides</i>
	<i>Dichopogon capillipes</i>
	<i>Laxmannia squarrosa</i>
	<i>Lomandra hermaphrodita</i>
	<i>Lomandra caespitosa</i>
	<i>Sowerbaea laxiflora</i>
	<i>Thysanotus manglesianus</i>
	<i>Thysanotus sp.</i>
	<i>Thysanotus thyrsoides</i>
Asteraceae	* <i>Arctotheca calendula</i>
	* <i>Cotula coronopifolia</i>
	* <i>Hypochaeris glabra</i>
	* <i>Ursinia anthemoides</i>
	<i>Blennospora drummondii</i>
	<i>Lagenophora huegelii</i>
	<i>Podotheca angustifolia</i>
	<i>Pterochaeta paniculata</i>
	<i>Xerochrysum macranthum</i>
Boraginaceae	* <i>Echium plantagineum</i>
Casuarinaceae	<i>Allocasuarina huegeliana</i>
	<i>Allocasuarina humilis</i>
Celastraceae	<i>Stackhousia monogyna</i>
Chenopodiaceae	<i>Tecticornia sp</i>
Cyperaceae	<i>Gahnia trifida</i>
	<i>Lepidosperma leptostachyum</i>
	<i>Mesomelaena tetragona</i>
	<i>Baumea articulata</i>
	<i>Cyperus bulbosus</i>
	<i>Isolepis cernua</i>
	<i>Lepidosperma aff. Apricola</i>
	<i>Lepidosperma aff. Costale</i>
	<i>Schoenus subfascicularis</i>
	<i>Schoenus unispiculatus</i>
	<i>Tetraria octandra</i>
Dilleniaceae	<i>Hibbertia commutata</i>
	<i>Hibbertia diamesogenos</i>
	<i>Hibbertia huegelii</i>
	<i>Hibbertia hypercoides</i>
Droseraceae	<i>Drosera stolonifera</i>
Elaeocarpaceae	<i>Tetratheca confertifolia</i>
	<i>Tetratheca hirsuita</i>
	<i>Tetratheca nuda</i>
	<i>Tetratheca pilifera</i>

Family	Species
Ericaceae	<i>Leucopogon nutans</i>
	<i>Leucopogon propinquus</i>
Fabaceae	* <i>Acacia podalyriifolia</i>
	* <i>Acacia iteaphylla</i>
	* <i>Acacia longifolia</i>
	* <i>Chamaecytisus palmensis</i>
	* <i>Lupinus angustifolius</i>
	<i>Acacia ?acuminata</i>
	* <i>Acacia baileyana</i>
	<i>Acacia decurrens</i>
	<i>Acacia nervosa</i>
	<i>Acacia pulchella</i> var. <i>pulchella</i>
	<i>Acacia willdenowiana</i>
	<i>Bossiaea eriocarpa</i>
	<i>Bossiaea ornata</i>
	<i>Bossiaea aquifolium</i>
	<i>Gastrolobium spinosum</i>
	<i>Gompholobium marginatum</i>
	<i>Sphaerolobium medium</i>
	<i>Viminaria juncea</i>
	* <i>Trifolium campestre</i>
	<i>Chorizema dicksonii</i>
	<i>Daviesia decurrens</i> subsp. <i>decurrens</i>
	<i>Daviesia hakeoides</i> subsp. <i>subnuda</i>
	<i>Dillwynia acerosa</i>
<i>Kennedia coccinea</i>	
<i>Kennedia prostrata</i>	
Goodeniaceae	<i>Dampiera lavandulacea</i>
	<i>Goodenia pulchella</i> subsp. <i>Wheatbelt</i> (L.W. Sage & F. Hort 795)
	<i>Lechenaultia</i> aff. <i>biloba</i>
	<i>Lechenaultia biloba</i>
	<i>Scaevola calliptera</i>
Haemodoraceae	<i>Conostylis setigera</i> subsp. <i>setigera</i>
	<i>Haemodorum simplex</i>
	<i>Haemodorum</i> sp.
Haloragaceae	<i>Glischrocaryon aureum</i>
	<i>Gonocarpus pithyoides</i>
Hemerocallidaceae	<i>Arnocrinum preissii</i>
	<i>Caesia micrantha</i>
	<i>Dianella revoluta</i>
	<i>Stypandra glauca</i>
	<i>Tricoryne elatior</i>
Iridaceae	* <i>Freesia alba</i> × <i>leichtlinii</i>
	* <i>Gladiolus caryophyllaceus</i>
	* <i>Moraea flaccida</i>
	* <i>Romulea rosea</i>
	* <i>Watsonia meriana</i> var. <i>bulbillifera</i>
	<i>Orthrosanthus laxus</i> var. <i>gramineus</i>
	<i>Patersonia occidentalis</i>

Family	Species
Juncaceae	* <i>Juncus acutus</i>
Lamiaceae	* <i>Lavandula sp.</i> <i>Hemigenia incana</i>
Lauraceae	<i>Cassytha glabella</i>
Myrtaceae	<i>Leptospermum erubescens</i> * <i>Leptospermum laevigatum</i> <i>Babingtonia camphorosmae</i> <i>Corymbia calophylla</i> <i>Eucalyptus marginata</i> <i>Eucalyptus patens</i> <i>Eucalyptus rudis</i> <i>Eucalyptus wandoo</i> <i>Melaleuca viminea</i>
Oleaceae	* <i>Olea europaea</i>
Orchidaceae	<i>Caladenia flava</i> <i>Caladenia sp.</i> <i>Pterostylis ?vittata</i> <i>Pterostylis recurva</i> <i>Pyrorchis nigricans</i>
Orobanchaceae	* <i>Orobanche minor</i>
Oxalidaceae	* <i>Oxalis pes-caprae</i>
Papaveraceae	* <i>Fumaria capreolata</i>
Phyllanthaceae	<i>Phyllanthus calycinus</i>
Pinaceae	<i>Pinus pinaster</i>
Pittosporaceae	<i>Billardiera ?fraseri</i> <i>Billardiera fusiformis</i> <i>Billardiera heterophylla</i>
Poaceae	* <i>Avena barbata</i> * <i>Briza maxima</i> * <i>Briza minor</i> * <i>Bromus diandrus</i> * <i>Cortaderia selloana</i> * <i>Ehrharta calycina</i> * <i>Eragrostis curvula</i> * <i>Lolium rigidum</i> <i>Austrostipa campylachne</i> <i>Austrostipa elegantissima</i> <i>Rytidosperma ?setaceum</i> <i>Neurachne alopecuroidea</i>
Polygonaceae	* <i>Rumex crispus</i>
Primulaceae	* <i>Lysimachia arvensis</i>
Proteaceae	<i>Hakea prostrata</i> * <i>Synaphea decorticans</i> <i>Adenanthos cygnorum subsp. cygnorum</i> <i>Banksia dallanneyi</i> <i>Banksia sessilis</i> <i>Banksia squarrosa</i> <i>Grevillea olivacea (Planted)</i> <i>Grevillea synapheae subsp. synapheae</i>

Family	Species
	<i>Hakea lissocarpha</i>
	<i>Hakea undulata</i>
	<i>Hakea ilicifolia</i>
	<i>Hakea undulata</i>
	<i>Synaphea decorticans</i>
Restionaceae	<i>Desmocladius asper</i>
	<i>Leptocarpus coangustata</i>
Rhamnaceae	<i>Cryptandra arbutiflora</i>
Rubiaceae	<i>Opercularia vaginata</i>
Sapindaceae	<i>Diplopeltis huegelii</i>
Stylidiaceae	<i>Levenhookia pusilla</i>
	<i>Stylidium tenue subsp. tenue</i>
Xanthorrhoeaceae	<i>Chamaescilla corymbosa</i>
	<i>Xanthorrhoea preissii</i>
Zamiaceae	<i>Macrozamia riedlei</i>

## **Appendix C Flora Site Sheets**

## FLORA SITE SHEET - GREAT EASTERN HIGHWAY COATES GULLY

**Project Name** 3564 Great Eastern Highway - Detailed Flora and Vegetation Survey  
**Site:** GEHR01 **MGA** 50J 446103.08 **mE** 6485658.31 **mN**

**Described by:** NW, CM  
**Date:** Wednesday, 9 October 2019  
**Type:** Revele 10 x 10  
**Soil Colour:** Brown,Grey  
**Soil Type:** Gravel,Sand  
**Habitat:** -



**Vegetation:**  
 Mid open forest of *Eucalyptus marginata* and *Corymbia calophylla* over Mid sparse shrubland of *Xanthorrhoea preissii*, *Phyllanthus calycinus*, *Bossiaea eriocarpa*, *Gastrolobium spinosum* over Low sparse sedgeland of *Tetraria octandra*

**Veg Condition:** Good  
**Fire Age:** Unknown **Fire Evidence:** -  
**Notes**  
**Rock Type** - **Rock Cover:** - % **Outcropping:** - %  
**Total PFC:** - % **Bareground:** - % **Leaf Litter:** - % **Logs:** - %  
**Disturbance Type:** -

### SPECIES LIST

Name	Height	Cover	Notes
<i>Bossiaea eriocarpa</i>	60	5	
<i>Corymbia calophylla</i>	1500	20	
<i>Eucalyptus marginata</i>	2000	35	
<i>Gastrolobium spinosum</i>	130	5	
<i>Phyllanthus calycinus</i>	45	10	
<i>Tetraria octandra</i>	40	4	
<i>Xanthorrhoea preissii</i>	200	15	

## FLORA SITE SHEET - GREAT EASTERN HIGHWAY COATES GULLY

**Project Name** 3564 Great Eastern Highway - Detailed Flora and Vegetation Survey  
**Site:** GEHR02 **MGA** 50J 446195.54 **mE** 6485742.59 **mN**

**Described by:** NW, CM  
**Date:** Wednesday, 9 October 2019  
**Type:** Revele 10 x 10  
**Soil Colour:** Brown,Grey  
**Soil Type:** Gravel,Sand

**Habitat:**

**Vegetation:**

Mid Woodland of *Eucalyptus wandoo*, and *Corymbia calophylla* over Mid shrubland of *Xanthorrhoea preissii*, *Phyllanthus calycinus* and *Lechenaultia biloba*



**Veg Condition:** Good  
**Fire Age:** Unknown

**Fire Evidence:** -

**Notes**

**Rock Type** - **Rock Cover:** - % **Outcropping:** - %  
**Total PFC:** 45 % **Bareground:** 3 % **Leaf Litter:** 35 % **Logs:** 0 %  
**Disturbance Type:** -

### SPECIES LIST

Name	Height	Cover	Notes
<i>Corymbia calophylla</i>	900	10	
<i>Eucalyptus wandoo</i>	1100	25	
<i>Lechenaultia biloba</i>	35	3	
<i>Phyllanthus calycinus</i>	55	10	
<i>Xanthorrhoea preissii</i>	110	6	



## FLORA SITE SHEET - GREAT EASTERN HIGHWAY COATES GULLY

**Project Name** 3564 Great Eastern Highway - Detailed Flora and Vegetation Survey  
**Site:** GEHR03 **MGA** 50J 440451.21 **mE** 6481060.6 **mN**

**Described by:** NW, CM  
**Date:** Thursday, 10 October 2019  
**Type:** Releve 10 x 10  
**Soil Colour:** Black,Brown,Grey,Orange  
**Soil Type:** Mud  
**Habitat:** 0



**Vegetation:**  
 Low open Forbland of *Tecticornia* sp. with *\*Juncus acutus*, *Isolepis cernua*, *\*Cotula coronopifolia* with scattered *Eucalyptus rudis*

**Veg Condition:** Degraded  
**Fire Age:** > 10 years **Fire Evidence:** -  
**Notes**  
**Rock Type:** - **Rock Cover:** - % **Outcropping:** - %  
**Total PFC:** 20 % **Bareground:** 70 % **Leaf Litter:** 0 % **Logs:** 5 %  
**Disturbance Type:** -

### SPECIES LIST

Name	Height	Cover	Notes
<i>*Cotula coronopifolia</i>	10	2	
<i>*Eragrostis curvula</i>	70	2	
<i>*Juncus acutus</i>	80	7	
<i>*Watsonia meriana</i> var. <i>bulbillifera</i>	100	2	
<i>Eucalyptus rudis</i>	600	4	
<i>Isolepis cernua</i>	10	3	
<i>Tecticornia</i> sp.	40	15	

## FLORA SITE SHEET - GREAT EASTERN HIGHWAY COATES GULLY

**Project Name** 3564 Great Eastern Highway - Detailed Flora and Vegetation Survey  
**Site:** GEHR04 **MGA** 50J 443044.75 **mE** 6484307.96 **mN**

**Described by:** NW, CM  
**Date:** Friday, 11 October 2019  
**Type:** Releve 10 x 10  
**Soil Colour:** Grey  
**Soil Type:** Sand  
**Habitat:**

**Vegetation:**  
 Tall sparse shrubland of *Melaleuca viminea* over Tall closed sedgeland of *Baumea articulata* over Low sparse grassland of *Avena barbata*, *Briza maxima* and *Bromus diandrus*.



**Veg Condition:** Good  
**Fire Age:** > 10 years **Fire Evidence:** -  
**Notes**  
**Rock Type** - **Rock Cover:** - % **Outcropping:** - %  
**Total PFC:** 95 % **Bareground:** 0 % **Leaf Litter:** 2 % **Logs:** 1 %  
**Disturbance Type:** -

### SPECIES LIST

Name	Height	Cover	Notes
* <i>Avena barbata</i>	20	4	
<i>Baumea articulata</i>	200	70	
* <i>Briza maxima</i>	25	4	
* <i>Bromus diandrus</i>	25	3	
* <i>Lolium rigidum</i>	10	1	
<i>Melaleuca viminea</i>	400	10	
* <i>Watsonia meriana</i> var. <i>bulbillifera</i>	50	1	

## FLORA SITE SHEET - GREAT EASTERN HIGHWAY COATES GULLY

**Project Name** 3564 Great Eastern Highway - Detailed Flora and Vegetation Survey  
**Site:** GEHR05 **MGA** 50J 442950.64 **mE** 6484168.77 **mN**

**Described by:** NW, CM  
**Date:** Friday, 11 October 2019  
**Type:** Releve 10 x 10  
**Soil Colour:** Brown  
**Soil Type:** Clay,Sand  
**Habitat:**

**Vegetation:**  
 Mid open forest of *Eucalyptus ?wandoo* over Tall open shrubland of *Melaleuca viminea* over Low open Forbland of *Stypandra glauca* , *Dianella revoluta* , *Sowerbaea laxiflora* and *Kennedia prostrata*



**Veg Condition:** Degraded

**Fire Age:** > 10 years

**Fire Evidence:** -

**Notes**

**Rock Type** -

**Rock Cover:** - % **Outcropping:** - %

**Total PFC:** 65 %

**Bareground:** 5 % **Leaf Litter:** 15 % **Logs:** 15 %

**Disturbance Type:** -

### SPECIES LIST

Name	Height	Cover	Notes
<i>Acacia pulchella</i> var. <i>pulchella</i>	50	1	
* <i>Avena barbatata</i>	100	5	
* <i>Briza maxima</i>	20	5	
<i>Conostylis setigera</i> subsp. <i>setigera</i>	10	0.5	
<i>Dianella revoluta</i>	60	1	
<i>Eucalyptus ?wandoo</i>	1000	35	
* <i>Fumaria capreolata</i>	5	0.5	
* <i>Hypochaeris glabra</i>	10	3	
<i>Kennedia prostrata</i>	5	0.5	
<i>Lepidosperma</i> aff. <i>apricola</i>	60	2	
<i>Melaleuca viminea</i>	400	25	
<i>Sowerbaea laxiflora</i>	20	25	
<i>Stypandra glauca</i>	40	2	
* <i>Ursina anthemoides</i>	15	3	
* <i>Watsonia meriana</i> var. <i>bulbillifera</i>	60	7	
<i>Xanthorrhoea preissii</i>	130	1	

## FLORA SITE SHEET - GREAT EASTERN HIGHWAY COATES GULLY

**Project Name** 3564 Great Eastern Highway - Detailed Flora and Vegetation Survey  
**Site:** GEHQ01 **MGA** 50J 438728.37 **mE** 6480441.94 **mN**

**Described by:** NW, CM  
**Date:** Thursday, 10 October 2019  
**Type:** Quadrat 10 x 10  
**Soil Colour:** Brown  
**Soil Type:** Sand  
**Habitat:** 0



**Vegetation:**  
 Mid Open forest of *Eucalyptus marginata*, *Eucalyptus wandoo* and *Corymbia calophylla* over Mid shrubland of *Xanthorrhoea preissii*, *Hakea lissocarpa* and *Hibbertia diamesogenos* over Low sparse sedgeland of *Lepidosperma* aff. *apricola* and *Tetraria octandra*

**Veg Condition:** Excellent  
**Fire Age:** > 10 years  
**Fire Evidence:** -  
**Notes**  
**Rock Type:** - **Rock Cover:** - % **Outcropping:** - %  
**Total PFC:** 100 % **Bareground:** 0 % **Leaf Litter:** 45 % **Logs:** 0 %  
**Disturbance Type:** -

### SPECIES LIST

Name	Height	Cover	Notes
* <i>Avena barbata</i>	40	0.5	
* <i>Avena barbata</i>	15	.5	
* <i>Ehrharta calycina</i>	70	1	
* <i>Freesia</i> sp.	15	6	
* <i>Hypochaeris glabra</i>	1	1	
<i>Synaphea decorticans</i>	50	0.1	
<i>Acacia pulchella</i> var. <i>pulchella</i>	100	4	
<i>Austrostipa campylachne</i>	60	0.5	
<i>Caesia micrantha</i>	40	0.5	
<i>Cassytha glabella</i>	0	0.5	Vine
<i>Conostylis setigera</i> subsp. <i>setigera</i>	10	0.5	
<i>Corymbia calophylla</i>	500	5	
<i>Cryptandra arbutiflora</i>	20	2.5	
<i>Dampiera lavandulacea</i>	25	2.5	
<i>Conostylis setigera</i> subsp. <i>setigera</i>	40	0.5	
<i>Desmocladius asper</i>	15	2	
<i>Eucalyptus marginata</i>	1000	35	
<i>Eucalyptus wandoo</i>	1100	25	
<i>Hakea lissocarpa</i>	110	2	
<i>Hibbertia diamesogenos</i>	10	3	
<i>Lechenaultia biloba</i>	20	0.5	
<i>Lepidosperma</i> aff. <i>apricola</i>	45	8	
<i>Levenhookia pusilla</i>	1	0.5	
<i>Lomandra caespitosa</i>	15	0.5	
<i>Neurachne alopecuroidea</i>	10	2	
<i>Phyllanthus calycinus</i>	30	1	
<i>Tetraria octandra</i>	40	8	
<i>Xanthorrhoea preissii</i>	120	40	

## FLORA SITE SHEET - GREAT EASTERN HIGHWAY COATES GULLY

**Project Name** 3564 Great Eastern Highway - Detailed Flora and Vegetation Survey  
**Site:** GEHQ02 **MGA** 50J 439223.76 mE 6480640.74 mN

**Described by:** NW, CM  
**Date:** Thursday, 10 October 2019  
**Type:** Quadrat 10 x 10  
**Soil Colour:** Brown  
**Soil Type:** Sand



**Habitat:**  
**Vegetation:**  
 Mid Woodland of *Eucalyptus wandoo* and *Corymbia calophylla* over Mid shrubland of *Xanthorrhoea preissii*, *Hakea lissocarpa*, *Cryptandra arbutiflora* and *Hibbertia diamesogenos* over Low sedgeland of *Lepidosperma* aff. *apricola* and *Lepidosperma* aff. *costale*

**Veg Condition:** Excellent  
**Fire Age:** > 10 years  
**Fire Evidence:** -  
**Notes**  
**Rock Type** Granite **Rock Cover:** - % **Outcropping:** 2-10% %  
**Total PFC:** 80 % **Bareground:** 2 % **Leaf Litter:** 35 % **Logs:** 0 %  
**Disturbance Type:** -

### SPECIES LIST

Name	Height	Cover	Notes
* <i>Asparagus asparagoides</i>	0	.5	Vine
* <i>Briza maxima</i>	15	5	
* <i>Lysimachia arvensis</i>	5	0.5	
* <i>Ursinia anthemoides</i>	10	0.5	
? <i>Haemodorum sp.</i>	30	3	
* <i>Acacia baileyana</i>	45	3	
<i>Acacia nervosa</i>	45	1.5	
<i>Acacia willdenowiana</i>	40	1	
<i>Arnocrinum preissii</i>	45	0.5	
<i>Austrostipa campylachne</i>	25	0.5	
<i>Austrostipa elegantissima</i>	50	3	
<i>Caesia micrantha</i>	20	0.5	
<i>Corymbia calophylla</i>	700	6	
<i>Cryptandra arbutiflora</i>	15	7	
<i>Dampiera lavandulacea</i>	25	5	
<i>Desmocladius asper</i>	5	0.5	
<i>Dianella revoluta</i>	45	1	
<i>Drosera stolonifera</i>	15	0.5	
<i>Eucalyptus wandoo</i>	1200	15	
<i>Gompholobium marginatum</i>	25	1	
<i>Haemodorum sp.</i>	45	0.5	
<i>Hakea lissocarpa</i>	100	1.5	
<i>Hakea undulata</i>	130	5	
<i>Hemigenia incana</i>	15	2	
<i>Hibbertia commutata</i>	40	0.1	
<i>Hibbertia diamesogenos</i>	5	20	
<i>Hibbertia hypericoides</i>	1	0.5	
<i>Kennedia coccinea</i>	5	1	
<i>Lechenaultia biloba</i>	30	5	
<i>Lepidosperma</i> aff. <i>apricola</i>	45	4	
<i>Lepidosperma</i> aff. <i>costale</i>	30	2	
<i>Neurachne alopecuroidea</i>	10	0.5	
<i>Opercularia vaginata</i>	15	1	
<i>Xanthorrhoea preissii</i>	200	4	

## FLORA SITE SHEET - GREAT EASTERN HIGHWAY COATES GULLY

**Project Name** 3564 Great Eastern Highway - Detailed Flora and Vegetation Survey  
**Site:** GEHQ03 **MGA** 50J 443272.25 mE 6484882.28 mN

**Described by:** NW, CM  
**Date:** Friday, 11 October 2019  
**Type:** Quadrat 10 x 10  
**Soil Colour:** Brown, Orange  
**Soil Type:** Gravel, Sand  
**Habitat:**  
**Vegetation:**

Mid Closed forest of Eucalyptus wandoo and *Allocasuarina huegeliana* over Tall sparse shrubland of *Banksia squarrosa*, *Xanthorrhoea preissii* and *Gastrolobium spinosum* over Mid open shrubland of *Hakea lissocarpha*, *Hibbertia hypericoides*, *Hibbertia commutata* over Low sparse sedgland of *Lepidosperma* aff. *costatale* and *Lepidosperma* aff. *apricola*



**Veg Condition:** Excellent  
**Fire Age:** > 10 years  
**Fire Evidence:** -  
**Notes**  
**Rock Type** Laterite  
**Rock Cover:** 0 < 1% %  
**Outcropping:** < 2% %  
**Total PFC:** 70 %  
**Bareground:** 4 %  
**Leaf Litter:** 75 %  
**Logs:** 0 %  
**Disturbance Type:** -

### SPECIES LIST

Name	Height	Cover	Notes
* <i>Ehrharta calycina</i>	50	1	
<i>Acacia baileyana</i>	40	2	
<i>Allocasuarina huegeliana</i>	800	15	
<i>Allocasuarina humilis</i>	200	2	
<i>Austrostipa elegantissima</i>	40	1	
<i>Banksia dallanneyi</i>	15	1.5	
<i>Banksia squarrosa</i>	250	25	
<i>Caesia micrantha</i>	30	0.5	
<i>Chamaescilla corymbosa</i>	7	0.5	
<i>Conostylis setigera</i> subsp. <i>setigera</i>	5	0.5	
<i>Dampiera lavandulacea</i>	30	1	
<i>Daviesia hakeoides</i> subsp. <i>subnuda</i>	30	0.5	
<i>Desmocladius asper</i>	5	1	
<i>Dichopogon capillipes</i>	25	0.5	
<i>Eucalyptus wandoo</i>	1500	75	
<i>Gastrolobium spinosum</i>	100	2	
<i>Gladiolus caryophyllaceus</i>	40	0.5	
<i>Hakea lissocarpha</i>	40	3	
<i>Hemigenia incana</i>	30	4	
<i>Hibbertia commutata</i>	15	0.5	
<i>Hibbertia diamesogenos</i>	10	1	
<i>Hibbertia hypericoides</i>	30	1	
<i>Lagenophora huegelii</i>	5	0.5	
<i>Lepidosperma</i> aff. <i>apricola</i>	60	4	
<i>Lepidosperma</i> aff. <i>costale</i>	30	4	
<i>Leucopogon propinquus</i>	20	0.5	
<i>Macrozamia riedlei</i>	45	0.5	
<i>Neurachne alopecuroidea</i>	10	1	
<i>Orthrosanthus laxus</i> var. <i>gramineus</i>	25	0.5	
* <i>Oxalis pes-caprae</i>	4	0.5	
<i>Phyllanthus calycinus</i>	30	2	
<i>Ptilotus manglesii</i>	5	1	
<i>Trachymene pilosa</i>	3	0.5	
* <i>Ursina anthemoides</i>	5	0.5	
<i>Xanthorrhoea preissii</i>	150	3	
<i>Xanthosia candida</i>	3	0.5	

## FLORA SITE SHEET - GREAT EASTERN HIGHWAY COATES GULLY

**Project Name** 3564 Great Eastern Highway - Detailed Flora and Vegetation Survey  
**Site:** GEHQ04 **MGA** 50J 443671.75 mE 6485233.08 mN

**Described by:** NW, CM  
**Date:** Friday, 11 October 2019  
**Type:** Quadrat 10 x 10  
**Soil Colour:** Brown, Orange  
**Soil Type:** Gravel, Sand  
**Habitat:**

**Vegetation:**  
 Mid Woodland of *Eucalyptus wandoo* over Tall open shrubland of *Banksia squarrosa*, *Xanthorrhoea preissii* and *Gastrolobium spinosum* over Low isolated clumps of shrubs of *Hibbertia hypericoides*, *Dampiera lavandulacea* and *Acacia pulchella* var. *pulchella* over Low sparse sedgeland of *Lepidosperma* aff. *apricola* and *Lepidosperma* aff. *costale*



**Veg Condition:** Excellent

**Fire Age:** > 10 years

**Fire Evidence:** -

**Notes**

**Rock Type** Laterite

**Rock Cover:** 1-5% % **Outcropping:** <2% %

**Total PFC:** 70 %

**Bareground:** 6 % **Leaf Litter:** 35 % **Logs:** 3 %

**Disturbance Type:** -

**SPECIES LIST**

Name	Height	Cover	Notes
<i>Acacia pulchella</i> var. <i>pulchella</i>	50	5	
<i>Austrostipa campylachne</i>	25	0.5	
<i>Austrostipa elegantissima</i>	45	1	
<i>Banksia dallanneyi</i>	10	1	
<i>Banksia squarrosa</i>	200	15	
<i>Blennospora drummondii</i>	5	0.5	
* <i>Briza maxima</i>	20	0.5	
<i>Chamaescilla corymbosa</i>	10	0.5	
<i>Conostylis setigera</i> subsp. <i>setigera</i>	10	0.5	
<i>Dampiera lavandulacea</i>	30	2	
<i>Desmocladius asper</i>	5	2	
<i>Diplopeltis huegelii</i>	10	0.5	
* <i>Ehrharta calycina</i>	30	0.5	
<i>Eucalyptus wandoo</i>	1700	25	
<i>Gastrolobium spinosum</i>	110	5	
<i>Gompholobium marginatum</i>	15	0.5	
<i>Goodenia pulchella</i> subsp. <i>Wheatbelt</i> (L.W. Sage & F. Hort 795)	10	0.5	
<i>Grevillea synapheae</i> subsp. <i>synapheae</i>	20	0.5	
<i>Hakea lissocarpha</i>	40	1	
<i>Hibbertia hypericoides</i>	30	1	
<i>Kennedia prostrata</i>	5	0.5	
<i>Lagenophora huegelii</i>	5	0.5	
<i>Lechenaultia hortii</i> (P2)	40	3	
<i>Lepidosperma</i> aff. <i>apricola</i>	45	8	
<i>Lepidosperma</i> aff. <i>costale</i>	20	0.5	
* <i>Lysimachia arvensis</i>	5	0.5	
<i>Neurachne alopecuroidea</i>	5	.5	
<i>Opercularia vaginata</i>	10	4	
* <i>Oxalis pes-caprae</i>	5	0.5	
<i>Phyllanthus calycinus</i>	20	1	
<i>Podotheca angustifolia</i>	2	0.5	
<i>Poranthera microphylla</i>	3	0.5	
<i>Pterochaeta paniculata</i>	5	0.5	
<i>Pterostylis recurva</i>	30	0.5	
<i>Ptilotus manglesii</i>	5	0.5	
* <i>Romulea rosea</i>	20	0.5	
<i>Stackhousia monogyna</i>	25	0.5	
<i>Thysanotus manglesianus</i>	30	0.5	Climber
<i>Trachymene pilosa</i>	4	0.5	
* <i>Ursinia anthemoides</i>	15	0.5	
<i>Xanthorrhoea preissii</i>	180	1	

## FLORA SITE SHEET - GREAT EASTERN HIGHWAY COATES GULLY

**Project Name** 3564 Great Eastern Highway - Detailed Flora and Vegetation Survey  
**Site:** GEHQ05 **MGA** 50J 441779.29 **mE** 6482167.89 **mN**

**Described by:** NW, CM  
**Date:** Friday, 11 October 2019  
**Type:** Quadrat 10 x 10  
**Soil Colour:** Brown  
**Soil Type:** Gravel,Sand

**Habitat:**  
**Vegetation:**

Mid Open Forest of *Eucalyptus wandoo* over Tall sparse shrubland of *Banksia squarrosa*, *Banksia sessilis* and *Hakea undulata* over Mid open shrubland of *Xanthorrhoea preissii*, *Hibbertia hypericoides*, *Dampiera lavandulacea* and *Sphaerolobium medium* over Low isolated clumps of sedges of *Lepidosperma* aff. *apricola* and *Lepidosperma* aff. *costale*



**Veg Condition:** Excellent  
**Fire Age:** >10 years

**Fire Evidence:** -

**Notes**

**Rock Type** - **Rock Cover:** - % **Outcropping:** - %  
**Total PFC:** 70 % **Bareground:** 2 % **Leaf Litter:** 30 % **Logs:** 0 %  
**Disturbance Type:** -

**SPECIES LIST**

Name	Height	Cover	Notes
* <i>Acacia baileyana</i>	50	4	
<i>Austrostipa campylachne</i>	15	0.5	
<i>Banksia dallanneyi</i>	15	1	
<i>Banksia sessilis</i>	300	3	
<i>Banksia squarrosa</i>	300	1	
<i>Billardiera fusiformis</i>	120	1	
<i>Bossiaea ornata</i>	40	0.5	
* <i>Briza maxima</i>	15	10	
<i>Caesia micrantha</i>	25	0.5	
<i>Caladenia flava</i>	10	0.5	
<i>Conostylis setigera</i> subsp. <i>setigera</i>	5	0.5	
<i>Dampiera lavandulacea</i>	30	2	
<i>Daviesia hakeoides</i> subsp. <i>subnuda</i>	45	1.5	
<i>Desmocladius asper</i>	5	0.5	
<i>Eucalyptus wandoo</i>	11	35	
* <i>Freesia alba</i> × <i>leichtlinii</i>	15	2	
<i>Gompholobium marginatum</i>	10	0.5	
<i>Gonocarpus pithyoides</i>	25	1	
<i>Grevillea synapheae</i> subsp. <i>synapheae</i>	10	0.5	
<i>Haemodorum</i> sp.	40	0.5	
<i>Hakea undulata</i>	150	3	
<i>Hemigenia incana</i>	15	1	
<i>Hibbertia commutata</i>	20	1.5	
<i>Hibbertia diamesogenos</i>	10	0.5	
<i>Hibbertia hypericoides</i>	40	3	
* <i>Hypochoeris glabra</i>	10	0.5	
<i>Lagenophora huegelii</i>	5	0.5	
<i>Laxmannia squarrosa</i>	4	0.5	
<i>Lechenaultia hortii</i> (P2)	30	1.5	
<i>Lepidosperma</i> aff. <i>apricola</i>	40	3	
<i>Lepidosperma</i> aff. <i>costale</i>	25	2	
<i>Leucopogon nutans</i>	120	2	
<i>Macrozamia riedlei</i>	80	1	
<i>Neurachne alopecuroidea</i>	10	0.5	
<i>Pterostylis recurva</i>	30	0.5	
<i>Ptilotus manglesii</i>	10	0.5	
<i>Rytidosperma</i> ? <i>setaceum</i>	5	0.5	
<i>Schoenus unispiculatus</i>	4	0.5	
<i>Sphaerolobium medium</i>	30	2	
<i>Stylidium tenue</i> subsp. <i>tenue</i>	6	0.5	
<i>Tetralix octandra</i>	40	0.5	
<i>Tetralix confertifolia</i>	10	1	
<i>Tetralix nuda</i>	25	0.5	
<i>Tetralix pilifera</i> (P3)	15	0.5	
<i>Trachymene pilosa</i>	3	0.5	
<i>Xanthorrhoea preissii</i>	130	25	
<i>Xanthosia candida</i>	10	0.5	



## FLORA SITE SHEET - GREAT EASTERN HIGHWAY COATES GULLY

**Project Name** 3564 Great Eastern Highway - Detailed Flora and Vegetation Survey  
**Site:** GEHQ06 **MGA** 50J 445319.5 **mE** 6485125.12 **mN**

**Described by:** NW, CM  
**Date:** Friday, 11 October 2019  
**Type:** Quadrat 10 x 10  
**Soil Colour:** Brown  
**Soil Type:** Sand



**Habitat:**  
**Vegetation:**  
 Mid open forest of *Eucalyptus wandoo*, *Eucalyptus marginata*, *Corymbia calophylla* over Tall open shrubland of *Banksia sessilis*, *Xanthorrhoea preissii* and *Hakea lissocarpa* and *Hibbertia diamesogenos* over Low sparse sedgeland of *Lepidosperma* aff. *apricola* and *Tetraria octandra*

**Veg Condition:** Excellent

**Fire Age:** > 5 years

**Fire Evidence:** -

**Notes**

**Rock Type** -

**Rock Cover:** - % **Outcropping:** - %

**Total PFC:** 85 %

**Bareground:** 0 % **Leaf Litter:** 75 % **Logs:** 0 %

**Disturbance Type:** Gravel Extraction

### SPECIES LIST

Name	Height	Cover	Notes
* <i>Acacia baileyana</i>	45	1	
<i>Acacia pulchella</i> var. <i>pulchella</i>	150	1.5	
<i>Arnocrinum preissii</i>	45	0.5	
<i>Banksia sessilis</i>	350	15	
<i>Billardiera ?fraseri</i>	100	1	
<i>Bossiaea eriocarpa</i>	40	1.5	
<i>Bossiaea ornata</i>	40	3	
* <i>Briza maxima</i>	15	0.5	
<i>Caesia micrantha</i>	25	0.5	
<i>Conostylis setigera</i> subsp. <i>setigera</i>	5	0.5	
<i>Corymbia calophylla</i>	1800	8	
<i>Daviesia hakeoides</i> subsp. <i>subnuda</i>	40	1	
<i>Dichopogon capillipes</i>	35	0.5	
<i>Eucalyptus marginata</i>	600	3	
<i>Eucalyptus wandoo</i>	1200	60	
<i>Gahnia trifida</i>	50	4	
<i>Gastrolobium spinosum</i>	100	1	
* <i>Gladiolus caryophyllaceus</i>	80	0.5	
<i>Hakea lissocarpa</i>	130	1	
<i>Hibbertia hypericoides</i>	30	2	
<i>Kennedia coccinea</i>	10	1	Creeper
<i>Lechenaultia hortii</i> (P2)	40	1	
<i>Lepidosperma</i> aff. <i>apricola</i>	45	7	
<i>Lomandra hermaphrodita</i>	25	0.5	
<i>Neurachne alopecuroidea</i>	0.5	5	
<i>Opercularia vaginata</i>	25	0.5	
* <i>Oxalis pes-caprae</i>	5	0.5	
<i>Phyllanthus calycinus</i>	40	2	
<i>Pterostylis ?vittata</i>	20	0.5	
<i>Pterostylis recurva</i>	30	0.5	
<i>Ptilotus manglesii</i>	5	0.5	
<i>Scaevola calliptera</i>	20	1	
<i>Tetraria octandra</i>	40	0.5	
<i>Thysanotus</i> sp.	30	0.5	
<i>Xanthorrhoea preissii</i>	120	6	
<i>Xanthosia candida</i>	5	0.5	

## FLORA SITE SHEET - GREAT EASTERN HIGHWAY COATES GULLY

**Project Name** 3564 Great Eastern Highway - Detailed Flora and Vegetation Survey  
**Site:** GEHQ07 **MGA** 50J 445515.4 mE 6485202.87 mN

**Described by:** NW, CM  
**Date:** Friday, 11 October 2019  
**Type:** Quadrat 10 x 10  
**Soil Colour:** Brown, Grey  
**Soil Type:** Sand  
**Habitat:**  
**Vegetation:**

Mid Open forest of *Corymbia calophylla*,  
*Allocasuarina huegeliana* and *Eucalyptus marginata*  
 over Tall open shrubland of *Banksia sessilis* and  
*Gastrolobium spinosum* over Low sparse shrubland of  
*Hakea lissocarpa*, *Hibbertia hypericoides* and  
*Acacia pulchella* var. *pulchella* over Low sparse  
 sedgeland of *Tetraria octandra* and *Lepidosperma* aff.  
*costatale*



**Veg Condition:** Excellent  
**Fire Age:** > 5 years **Fire Evidence:** -  
**Notes**  
**Rock Type** - **Rock Cover:** - % **Outcropping:** - %  
**Total PFC:** 85 % **Bareground:** 2 % **Leaf Litter:** 35 % **Logs:** 0 %  
**Disturbance Type:** -

### SPECIES LIST

Name	Height	Cover	Notes
<i>Acacia pulchella</i> var. <i>pulchella</i>	60	3	
<i>Allocasuarina huegeliana</i>	700	20	
<i>Austrostipa campylachne</i>	80	0.5	
<i>Babingtonia camphorosmae</i>	50	1	
<i>Banksia dallanneyi</i>	15	0.5	
<i>Banksia sessilis</i>	400	13	
<i>Bossiaea ornata</i>	30	1	
* <i>Briza maxima</i>	15	1	
<i>Caesia micrantha</i>	35	0.5	
<i>Caladenia</i> sp.	10	0.5	
<i>Conostylis setigera</i> subsp. <i>setigera</i>	10	0.5	
<i>Corymbia calophylla</i>	1400	30	
<i>Dampiera lavandulacea</i>	30	2	
<i>Daviesia decurrens</i> subsp. <i>decurrens</i>	40	0.5	
<i>Dichopogon capillipes</i>	20	0.5	
<i>Dillwynia acerosa</i>	45	0.5	
<i>Eucalyptus marginata</i>	2200	20	
<i>Gahnia trifida</i>	40	0.5	
<i>Gastrolobium spinosum</i>	120	2	
<i>Hakea lissocarpa</i>	80	1	
<i>Hakea undulata</i>	40	0.5	
<i>Hibbertia huegelii</i>	15	0.5	
<i>Hibbertia hypericoides</i>	40	6	
<i>Lechenaultia hortii</i> (P2)	35	2	
<i>Lepidosperma</i> aff. <i>apricola</i>	60	10	
<i>Macrozamia riedlei</i>	80	0.5	
<i>Neurachne alopecuroidea</i>	5	1	
<i>Opercularia vaginata</i>	25	0.5	
<i>Patersonia occidentalis</i>	40	.5	
<i>Phyllanthus calycinus</i>	10	2	
<i>Poranthera microphylla</i>	3	0.5	
<i>Ptilotus manglesii</i>	5	0.5	
<i>Tetraria octandra</i>	40	2	
<i>Thysanotus thyrsoides</i>	25	0.5	
<i>Trachymene pilosa</i>	4	0.5	
<i>Tricoryne elatior</i>	40	1	



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